ENVIRONMENTAL ASSESSMENT

Hunter Solar, LLC
Arapahoe County, Colorado

Hunter Solar, LLC

U.S. Department of Agriculture
Rural Utilities Service (RUS)

Prepared for:
U.S. Department of Agriculture
Rural Utilities Service

Submitted By:
Hunter Solar, LLC

Prepared By:
Spirit Environmental
Denver, CO

Please submit comments and written questions to:

Omololu Dawodu
Environmental Protection Specialist
Environmental & Engineering Staff, Rural Development
United States Department of Agriculture
202.720.5653
Omololu.dawodu@usda.gov

TABLE OF CONTENTS

Section **Page**

LIST OF APPENDICES

LIST OF TABLES

LIST OF FIGURES

SYMBOLS, ACRONYMS, AND ABBREVIATIONS

%	percent
AADT	Average Annual Daily Traffic
AC	alternating current
AIMA	Agricultural Impact Mitigation Agreement
APE	area of potential effect
AQI	Air Quality Index
BEA	Bureau of Economic Analysis
BGEPA	Bald and Golden Eagle Protection Act
bgs	below ground surface
BMP	Best Management Practice
CAA	Clean Air Act of 1970
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CPW	Colorado Parks and Wildlife
CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Public Health and Environment
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibels
dbh	diameter at breast height
DC	direct current
DEM	Digital Evaluation Model
DSM	Digital Surface Model
DOLA	Department of Local Affairs
EA	Environmental Assessment
EcoCAT	Ecological Compliance Assessment Tool
EIS	Environmental Impact Statement
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FEJA	Future Energy Jobs Act
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
FRA	Federal Railroad Association
GHG	greenhouse gas
HP	horsepower
HUC	Hydrologic Unit Code
HUD	US Department of Housing and Urban Development
IPaC	Information for Planning and Consultation
ISO	International Organization of Standardization

JD	jurisdictional determination
KOP	Key Observation Points
kV	kilovolt
kVA	kilovolt-amps
kW	kilowatt
Ldn	day-night average sound level
Leq	Sound Level Equivalents
LF	linear feet
LRR	Land Resource Region
MBTA	Migratory Bird Treaty Act
MISO	Midcontinent Independent System Operator
MLRA	Major Land Resource Area
msl	mean sea level
MW	megawatts
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NOI	Notice of Intent
NOx	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
O_3	ozone
OAHP	Office of Archaeology and Historic Preservation
OHWM	ordinary high water mark
OSHA	Occupational Safety and Health Administration
Pb	lead
PEM	Palustrine Emergent Wetland
PM_{10}	particulate matter whose particles are less than or equal to 10 micrometers
$PM_{2.5}$	particulate matter whose particles are less than or equal to 2.5 micrometers
POW	palustrine open water
ppb	parts per billion
PPE	personal protective equipment
ppm	parts per million
PV	photovoltaic
REC	recognized environmental conditions
ROW	right-of-way
RUS	Rural Utilities Service
SHPO	State Historical Preservation Officer
SIP	State Implementation Plan
SO_2	sulfur dioxide
SPCC	Spill Prevention, Countermeasure and Control

SWPP	Stormwater Pollution Prevention Plan
U.S.C.	United States Code
ug/m3	micrograms per cubic meter
US	United States
USACE	US Army Corps of Engineers
USCB	US Census Bureau
USDA	US Department of Agriculture
USDOT	U.S. Department of Transportation
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
V3	V3 Companies
VOC	volatile organic compound
WOUS	Waters of the US

CHAPTER 1

1.0 INTRODUCTION

USDA Rural Development is a mission area that includes three Federal agencies: Rural Business-Cooperative Service, Rural Housing Service, and RUS. The agencies have in excess of 50 programs that provide financial assistance and a variety of technical and educational assistance to eligible rural and tribal populations, eligible communities, individuals, cooperatives, and other entities with a goal of improving the quality of life, sustainability, infrastructure, economic opportunity, development, and security in rural America. Financial assistance can include direct loans, guaranteed loans, and grants in order to accomplish program objectives.

For the proposed Project, the Applicant has requested RUS Electric Program loan funds as authorized under the Rural Electrification Act of 1936, as amended. Electric Program loans finance the construction of electric distribution, transmission, and generation facilities, including system improvements and replacement required to furnish and improve electric service in rural areas, as well as demand side management, energy efficiency and conservation programs, and on-grid and off-grid renewable energy systems.

Supporting renewable energy projects, such as Hunter Solar, LLC, meets both RUS's goal to support infrastructure development in rural communities and USDA's support of the June 2013 Climate Action Plan, which encourages voluntary actions to increase energy independence. (USDA, 2014, 2020a, 2020b, 2020c).

Hunter Solar, LLC has requested long-term financing from the Rural Utilities Service (RUS), an agency of the U.S. Department of Agriculture (USDA) Rural Development, for construction of the proposed Hunter Solar Project (Project). RUS is considering financing the proposed Project through a RUS guaranteed Federal Financing Bank loan, thereby making the proposed Project a Federal action subject to review under the National Environmental Policy Act of 1969 (NEPA), and all applicable Federal environmental laws and regulations. This Environmental Assessment (EA) has been prepared to analyze potential impacts to the natural and human environments associated with the Project in accordance with 7 Code of Federal Regulations (CFR) Part 1970, RUS' Environmental Policies and Procedures, and 40 CFR 1500-1508, the regulations promulgated by the Council on Environmental Quality (CEQ) for implementing NEPA.

This EA also addresses other laws, regulations, executive orders (EOs), and guidelines promulgated to protect and enhance environmental quality including, but not limited to, the National Historic Preservation Act (NHPA), the Endangered Species Act (ESA), the Farmland Protection Policy Act (FPPA), the Clean Water Act (CWA), and EOs governing floodplain management, protection of wetlands, and environmental justice.

The purpose of this EA is to analyze the potential environmental impacts of the Proposed Action to determine whether to prepare an Environmental Impact Statement (EIS) or a Finding of No

Significant Impact (FONSI). The EA provides a detailed description of the Proposed Action, identifies natural resources within the project area, describes the purpose and need, and analyzes alternatives considered reasonable and feasible to accomplish the Proposed Action. Discussions of the affected environment, the environmental consequences of the project, and the mitigation of the potential environmental impacts are also included. Based on the analysis contained in this document, RUS will decide:

1. Whether to proceed with financing the Proposed Action.

2. Whether the alternative that is selected would have a significant impact on the quality of the human environment.

If, after circulating the document for public and agency comment, RUS finds the proposed Project will not have a significant impact on the quality of the human environment, it will prepare a FONSI. If at any point in the preparation of an EA, RUS determines the proposed Project will have a significant impact on the quality of the human environment, it will initiate preparation of an EIS.

1.1 PURPOSE AND NEED

The State of Colorado's Renewable Portfolio Standard has set standards and goals for renewable energy production within the state. Both the Intermountain Rural Electric Association and Holy Cross Energy, the two utilities purchasing power produced by the Hunter Solar project, have committed to carbon neutral, renewable energy, and greenhouse gas emission reduction goals that support the Statewide Renewable Portfolio Standard.

In 2019, Hunter Solar secured two Power Purchase Agreements for the production from the Project. Holy Cross Energy has agreed to purchase 30MW of capacity and Intermountain Rural Electric Association has agreed to purchase 45MW. These long-term power purchase contracts will serve utilities with members throughout the rural region southeast of Denver and in the mountain communities in Eagle, Garfield, and Pitkin Counties. The Hunter Solar Project would assist the State of Colorado in attaining its Renewable Portfolio Standard goal by producing clean energy, creating solar jobs, reducing air pollution, lowering wholesale electricity prices, and providing replacement load for retiring generation facilities.

Colorado has identified the advancement of renewable energy and energy efficiency as a statewide goal. The State of Colorado adopted the Renewable Energy Standard (RES) in 2004. Colorado was the first state in the nation to mandate investor-owned utilities generate a minimum percentage of their power from renewable energy sources. The most recent update, SB 13-252, stipulates at least thirty (30) percent of the power generated by an investor-owned utility be sourced from renewable energy sources. Arapahoe County has identified a commitment to increasing energy conservation in the Arapahoe County Comprehensive Plan (ACCP). Comprehensive Plan Policy NCR 4.2 "Encourage Reduction in Energy Consumption" details: "Arapahoe County will encourage reduction in energy consumption to conserve resources and to maintain air quality,

through education and by providing incentives for energy efficient building design and solar-oriented site planning."

Hunter Solar, and similar solar energy facilities, are essential to achieving the sustainability goals of the State of Colorado. Each 75 MW solar energy facility that can be placed in Colorado can offset an estimated 117,024 tons of carbon dioxide annually, the equivalent of 16,674 homes powered per year or 11,283 cars off the road. Solar energy facilities such as the Hunter Solar facility also demonstrate a commitment to renewable energy by Arapahoe County and the State of Colorado.

1.2 PUBLIC INVOLVEMENT AND AGENCY INVOLVEMENT

Legal Public Notice ("LPN") of the availability of this EA and a 15-day public comment period will be published in the I-70 Scout and the Villager Newspaper on [MONTH, DAY, 2020].

1.3 PROJECT DESCRIPTION

Under the Proposed Action, Hunter Solar, LLC would develop a 75 MW alternating current (AC) solar photovoltaic (PV) generation facility located on undeveloped, unincorporated, agricultural land in Arapahoe County, Colorado (Figure 1.1-1).

The Project site is located along the intersection of E Quincy Ave (Highway 30) and N County Road 129 (N Brickcenter Road), Bennett, CO 80102. The property is zoned Agricultural-1 (A-1) and has received a Use by Special Review permit with 1041 permit requirements. The 1041 Regulations were enacted by the Colorado General Assembly in 1974. Commonly referred to as "1041 powers", these regulations help define the authority of the state and local governments in making planning decisions for matters of statewide interest through a local permitting process. Through this process, local governments are provided the power to maintain control over development projects with statewide impacts. The Project falls under the construction of a major facility of a public utility, which is included as a matter statewide interest (Colorado Department of Local Affairs [DOLA] 2020a). Hunter Solar, LLC will lease a portion of approximately 571 acres of the parcels owned by five landowners for an initial 20-year term with the option of four, 5-year renewals.

Hunter Solar will contain rows of Photovoltaic (PV) cell panels, also referred to as modules, mounted on posts set in the ground. These rows of PV panels are referred to as "solar arrays." The solar arrays will be mounted on a tracking system, which allows them to follow the sun throughout the day as the panels face east in the morning, are horizontal at midday, and face west in the afternoon. Solar components will comply with the current edition of the National Electric Code, be UL listed (or equivalent), and designed with an anti-reflective coating. There will be approximately two hundred fifty thousand (250,000) 440-watt solar modules, thirty (30) inverters, and thirty (30) transformers on site. The anticipated power output of the Project is approximately 188,750,000 kilowatt-hours (kWh) annually, enough to power 16,674 single-family homes located in the Intermountain Rural Electric Association (IREA) territory near the Bennett area.

Hunter Solar, LLC will own, operate, and maintain the system. The Project will provide locally generated energy, result in increased income for land owners, and enhance the economy and tax base for Arapahoe County. Furthermore, the development of solar energy facilities allows property owners to maintain large tracts of land that are easily redeveloped at an appropriate time in the future. Hunter Solar will take approximately 9-12 months to construct. Once construction is complete, routine maintenance will occur approximately twice per week by a standard size pick-up truck. The Project will not require manned labor on-site nor will it require County sewer; however the Project may require municipal sources for water. The operations and maintenance labor personnel will travel to and from the site to perform the necessary tasks when required. Monitoring staff are located offsite. The Project will be completely enclosed by an approximately eight foot (8') tall chain-link fence.

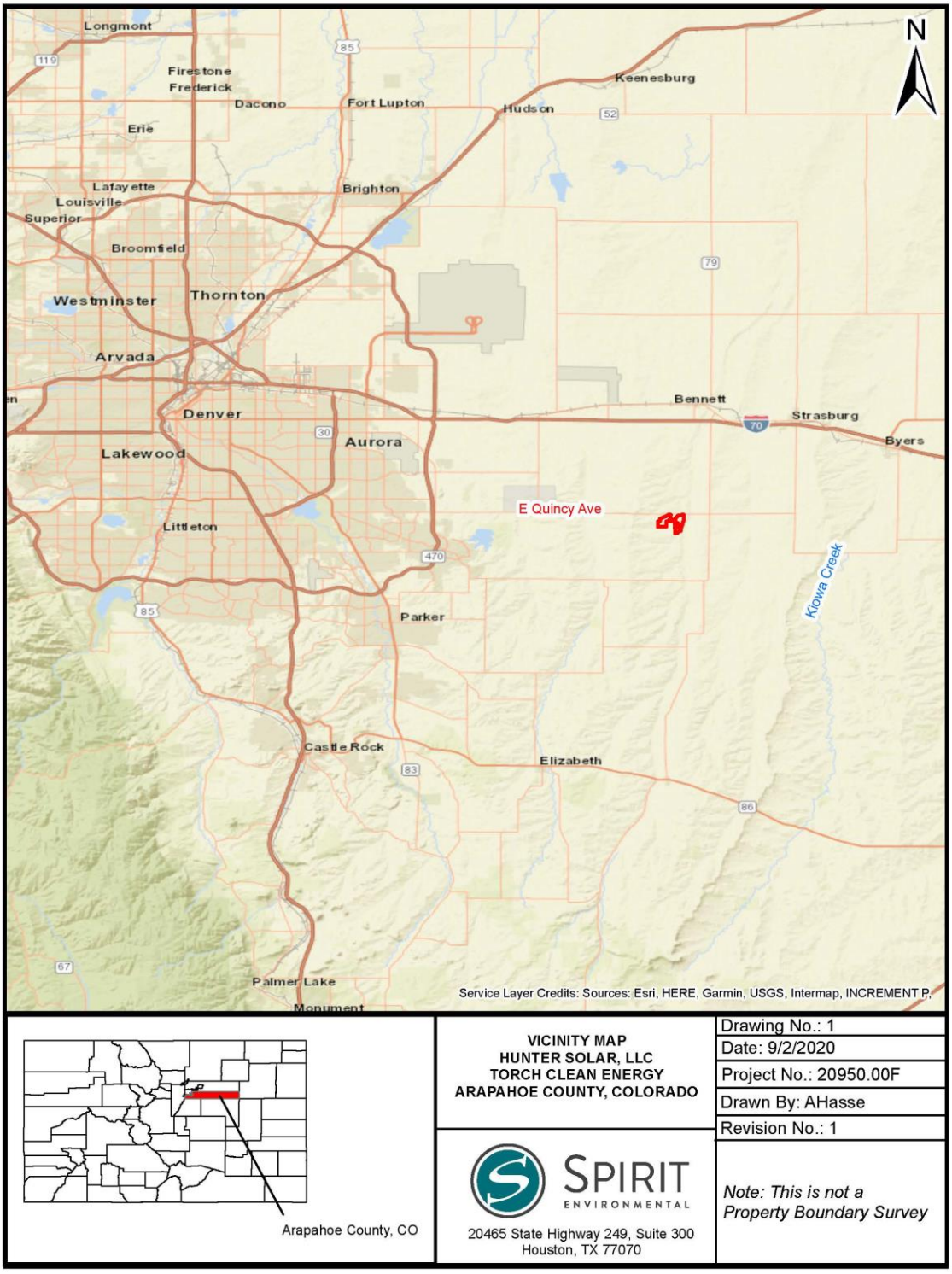


Figure 1.1-1. Project Site Location

1.3.1 Site Description

The Project site would consist of approximately 571 acres of five parcels of predominately agricultural land owned by various individual private parties. The Project site is located approximately 8.5 miles south of the Town of Bennett in Arapahoe County or approximately 19 miles north of the town of Kiowa in Elbert County, Colorado. The Project site is located south of East Quincy Avenue (Figure 1.1-1), approximately 13 miles east of E470. The site would be accessed from County Road 129 (also referred to as Brickcenter Road).

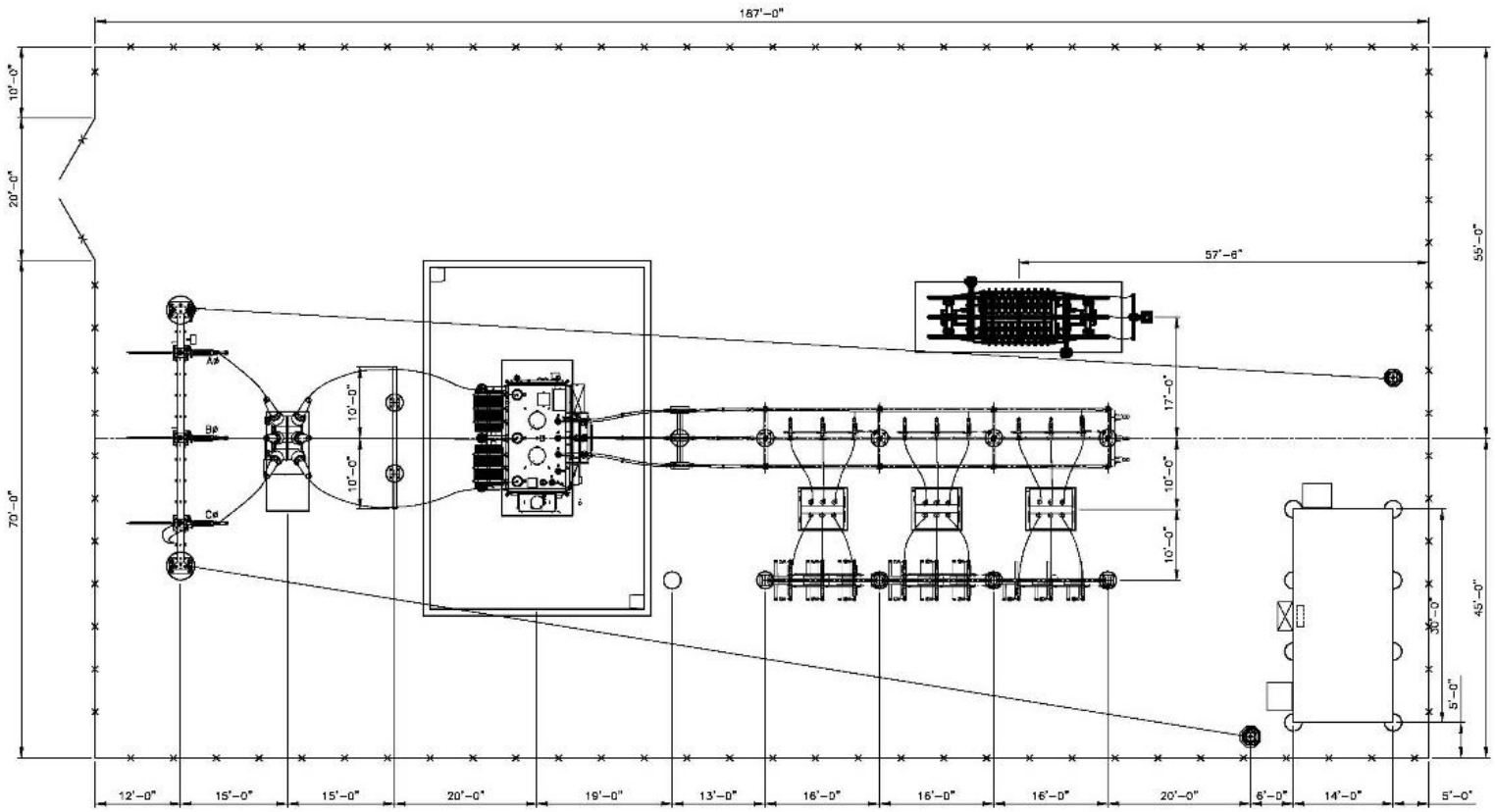
Hunter Solar, LLC has secured land leases with landowners. At present, more land is leased than would be needed for the final project. All "excess" land which is not needed for the Proposed Action would be returned to the land owners with no future restrictions or obligations within regard to use of the land upon finalization of the Project layout and Project approval.

1.3.2 Generating Facility Description

Solar PV generation is the direct conversion of sunlight (photons) into electricity (voltage). Approximately 250,000 solar modules would be arranged on the site in the form of single-axis tracking solar arrays. Structures supporting the PV modules would consist of steel piles (e.g. cylindrical pipes, H-beams, or equivalent). The anticipated rated power of the panel system would be 440-watts per panel. The panels themselves would measure approximately 3 to 4 feet wide by 6 to 7 feet in height (~1 meter by ~2 meters). The solar panels are anticipated to be mounted on a galvanized steel and/or aluminum rack system, positioned approximately 2 to 3 feet above the finished grade, thus reaching a total height of 8 to 12 feet. The racking system consists of a +/- 60-degree range of motion (single axis) tracker positioned to track the sun. A concrete foundation would not be required to support the racking system. The racking system foundation would instead consist of metal posts (pilings) pile-driven into the ground to a depth just below the frost level. Rows would be spaced approximately 20 feet apart. The Project is currently planning to use LONGi Solar LR4-72HBD 415-445M (or equivalent) solar panels and Sungrow SG3150U-MV 3150 kVA inverters (or equivalent). All required equipment would be manufactured off-site and delivered to the site for final assembly and installation.

The proposed design is laid out primarily in 3-MW increments (blocks). Each 3-MW block would include an inverter-transformer station constructed on a concrete pad or a pile mounted steel skid located on the perimeter of the PV module block. Direct Current (DC) cables would be installed to transmit DC current to inverters where the DC is converted to AC, which would then be carried to a central substation location where the voltage would be transformed to 115-kilovolts (kV). A typical substation design is illustrated in Figure 2.1-1. DC cables would be installed belowground at depths between 30 and 42 inches deep; medium voltage cables would be installed between 36 and 48 inches depth.

The exact number of blocks, arrays, and modules would be finalized during detailed design. Figure 2.1-2 presents a diagram of a typical solar farm layout, which consists of (A) aboveground/belowground cabling; (B) cable combiner boxes (optional); (C) DC to AC power inverters (see Photo 2.1-1); and (D) on-site substation with a step-up transformer. Specifically, power generated by the Project would be transmitted via a 34.5-kV collection system to a proposed on-site substation where a step-up transformer would increase the voltage to match the nearby 115-kV IREA-owned substation. The proposed on-site substation, housed within a fenced and graveled yard, would include buses, circuit breakers, disconnect switches, grounding, and the main step-up transformer. A short intertie would connect the proposed on-site substation to the adjacent, existing off-site IREA substation. The enclosure for the substation would house all of the protection and control equipment, metering equipment, automation relay panels, and communication equipment. Equipment would be installed on concrete foundations and would be connected using standard electrical bus materials or aluminum conductor steel-reinforced cable. The on-site substation would be protected by overhead lightning arrestors and minimally lit as necessary for the health and safety of persons needing to enter the facility for operations purposes. The Project would abide by lighting, off-street parking and loading, signage, and storage regulations in accordance with the Arapahoe County Zoning Code. The Project would also comply with local, State, and Federal guidelines, and the National Electric Code.



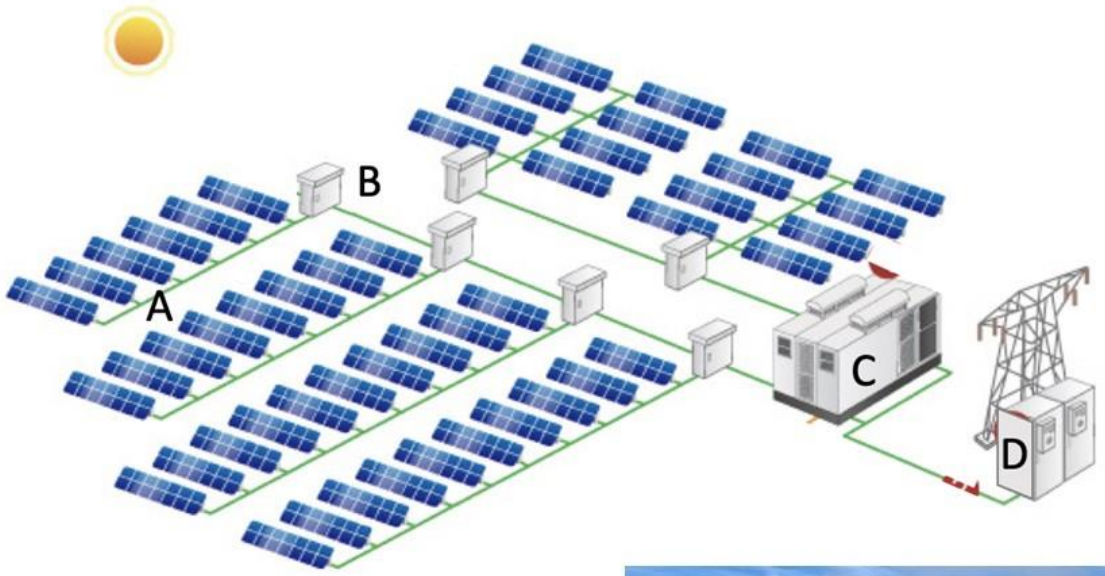
Notes:

1. Stud connectors furnished with transformer and breakers.
2. Drill 1/4" in diameter holes at low point of each bus section.
3. All 4 in AL pipe horizontal runs shall be filled with one 795 ACSR damper cable.
4. URD cables and termination by collection system contractor.
5. Add bollards for physical protection of 8 in SCH 40 PVC
6. Phasing to be confirmed with utility.

SCALE: 1/5"=1'-0"
0 2 4 6 8 10

THIS LINE IS ONE INCH WHEN DRAWING IS FULL SIZE, IF NOT ONE INCH, SCALE ACCORDINGLY.

Figure 2.1-1. Typical Substation Design



Solar Farm Components

(A) Green lines are below ground cabling

(B) Cable combiner boxes (optional)

(C) DC to AC power inverters

(D) On-site substation with a step-up transformer.

Figure 2.1-2. Typical Solar Farm Layout

The Project's on-site roadway system would include internal roads and access roads, each approximately 20 feet in width. These roads would be surfaced with native compacted soil or gravel (where necessary) and would accommodate the Project's operations and maintenance activities. All delineated wetlands and streams within the project boundary would be avoided with a 50-foot protective buffer. All solar equipment would be setback 50 feet from overhead electric lines and 100 feet from residentially zoned lots and existing residential properties. The Project facilities within the fence would be setback 50 feet from all other property lines. The Project site would be fully enclosed with a perimeter security fence approximately eight feet in height.

1.3.3 Site Preparation

Site preparation (surveying and staking, removal of tall vegetation, grading, development of site roads, installation of a perimeter security fence, and preparation of construction laydown or staging areas) would be required prior to construction of the solar facility.

Hunter Solar, LLC would utilize industry standard practices to work with the existing landscape (e.g., slope, drainage, utilization of existing roads) where feasible and minimize or eliminate grading work to the extent possible. Any required grading activities would be performed with portable earthmoving equipment (such as motor graders) and would result in a relatively consistent slope to local land areas. Silt fence and other appropriate controls would be used (as needed) to prevent soil from leaving the work area. Disturbed areas would be revegetated post-construction using a mixture of certified weed-free, low-growing native and/or non-invasive grass seed. Erosion control measures would be inspected and maintained until vegetation in the disturbed areas has returned to the pre-construction conditions or the site is stable.

Grading would consist of the excavation and compaction of earth to meet the final design requirements. Due to the existing topography of the site and the use of single-axis tracking, cut and fill grading activities would be required in some areas to achieve the final design and maximum slope criteria. Grading may include stripping, cutting, filling, stockpiling or any cut and fill quantity of earthwork to the extent practical and therefore not require any off-site and minimal on-site hauling.

The grading plan would be finalized during the design process. Where necessary, tall vegetation would be removed from both permanently and temporarily disturbed areas to reduce shading and maximize power production. Once areas to be avoided are marked, construction areas would be cleared and mowed of vegetation and miscellaneous debris. To control vegetation growth during construction, ongoing mowing and operations would continue.

No permanent stormwater measures such as detention basins or infiltration swales will be required; however, three small driveway culverts are proposed for access road connections and a box culvert is proposed to cross a drainage from the access road. To minimize potential for runoff of water and soil during the construction process, temporary stormwater controls would be constructed in accordance with the site's Stormwater Pollution Prevention Plan (SWPPP).

1.3.4 Construction

Construction of the solar facility includes assembly of the solar arrays, pile driving for the support structures, installation of the solar panels and equipment, electrical interconnection, testing/verification activities, and construction of ancillary facilities.

The general construction sequence for the solar arrays is assumed to be as follows:

- Prior to the start of foundation installation, any grading work necessary to support the installation of the single axis trackers would be completed, after which the areas would be properly seeded to support early vegetative growth.
- Following grading and seeding, the racking foundations would be installed. Foundations generally consist of W6 x 9 steel piling and are installed with small pile driving equipment such as Vermeer PD10s which install the piles through repeated hammer blows to the top of the foundation.
- After foundation piles are installed, bearing assemblies would be installed on the top of each pile, with the center pile in a tracker receiving the motor and slew drive which would rotate the torque tube (racking) and modules to follow the sun's path across the sky.
- Modules would be attached to the torque tube with the corresponding racking suppliers module clamps. Modules would be aligned and secured accordingly. Following installation of the modules, the module whips (electrical wires) would be connected and securely fastened to the modules and torque tube in a neat and tidy fashion with the DC cables leading back to combiner boxes and then to the inverters or directly to the inverters.
- During the installation of the foundations and racking, separate crews would trench and install the DC cables and AC conductors (34.5-kV collection system). These conductors would be installed within the fence line in trenches between 30 and 42 inches deep such that there is a minimum soil cover as required by the National Electric Code. Outside the fence line, trenches for cabling connecting parcels of panels would be installed.
- Concurrently, the project substation would be constructed such that it would be complete roughly one month prior to the completion of the solar field.

Galvanized steel would support most of the substation equipment. Concrete foundations and embedment for equipment would be installed with trenching machines, concrete trucks and pumpers, vibrators, forklifts, boom trucks, and large cranes. Aboveground and below-ground conduits from this equipment would run to the control enclosure. For personnel safety and equipment protection during faulted conditions, a ground grid would be installed in the area. This would consist of appropriately-sized conductors meshed and buried below ground. Each piece of equipment and supporting structure within the substation would be electrically connected to the ground grid per the requirements of Institute of Electrical and Electronics Engineers Standard 80.

It is anticipated that water would be needed for soil compaction and dust control during construction, including on access roads, as a standard best management practice (BMP). During construction, the primary water use would be dust control during grading activities. It is estimated a maximum of 45 acre feet of water would be required during construction. Water would be trucked into the site from a certified dealer from the Town of Bennett, Colorado where the water

will come from ground water wells in the Denver Basin Aquafer . As grading activities are completed, overall project water requirements would decrease. Portable toilets would be available on-site for the duration of the construction period.

Construction Schedule and Workforce

The Hunter Solar, LLC Project would be constructed over a period of up to approximately nine to 12 months and would employ up to 250 workers per day during the peak construction period. During the peak of construction, a typical day would include the transportation of workers, movement of heavy equipment, and transportation of materials. Table 2.1-1 provides a list of equipment commonly associated with the construction of a typical solar project of this size.

Table 2.1-1. Construction Equipment (Typical Solar Project)

Equipment	Use
Boom Truck/Truck Mounted Crane	Move materials
Concrete Mixing Trucks	Delivery of concrete used for slabs and foundations
Disposal Containers	Disposal and removal of construction debris
Excavators	Trenching and foundations
Forklifts	Move materials, loading and unloading of trucks
Generator Sets/Load Banks	Temporary power
Graders	Access road and driveway leveling
Other Material Handling Equipment	Move materials
Plate Compactors/Jumping Jacks	Compact soil under concrete slabs and foundations
Pile/Vibratory Drivers	Drive structure posts
Rollers	Compact access roads and driveways
Tractors/Loaders/Backhoes	Clear and grubbing and move soil
Trenchers	Light trench work
Welders	Assembly of structures
Storage Containers	Storage of onsite materials
Service Trucks	Maintenance of heavy equipment
Personnel transport vehicles	Transport workers
Water Trucks	Dust control

Construction Transportation

Following site preparation, the supporting mounting structures would be delivered, offloaded, assembled, and installed in accordance with a construction schedule. The solar modules would then be delivered and offloaded at either a lay-down staging area or, depending on the timing of the deliveries, be placed proximate to the designated construction area.

Vehicle trip generation for employees, delivery trucks, and construction equipment would vary depending on the phase of construction. Daily traffic is expected to include construction vehicles, shipping trucks, and workers' vehicles. During the peak construction period there could be up to 250 construction worker vehicles coming and going from the site if all workers utilized their own transportation. It is anticipated that on average approximately five construction vehicles and eight to nine shipping trucks would come and go from the site each day, though these numbers would likely also increase during the peak construction period. Overall, approximately 3,000 construction related vehicle trips are expected to occur throughout the full construction period.

The anticipated transportation routes to the Hunter Solar, LLC Project site from major regional highways are shown in Figure 2.1-3. Most, if not all, of these vehicles are expected to travel County Road 30 and County Road 129, which will provide access to the site.

Typical transport shipping and container trucks would be used to transport equipment to the site. Typical shipping containers are 40 feet in length and shipping trucks can vary between 45 to 53 feet in length. The majority of the transport vehicles are expected to be 45,000 pounds in cargo weight or less and would typically hold between 34,000 to 44,000 pounds of cargo. The exception is transportation of the Main Power Transformer which will be approximately 150,000 pounds. The unloaded weight of a shipping vehicle or container is typically around 15,000 pounds without any contents and not including the weight of the truck. Transport deliveries of the solar equipment would account for about a third of the daily trips, or eight to nine vehicles per day. All transport vehicles would comply with the Colorado Department of Transportation (CDOT) Maximum Legal Dimensions and Weights on Federal, State, and local Routes.

During construction, the Project components, including the solar modules, mounting system, inverters, transformers, electrical cabling, and ancillary construction equipment would be transported to the site using standard trucking methods as described above. Hunter Solar, LLC would coordinate with Arapahoe County, as appropriate, to assure construction traffic does not place any undue burdens on the community.

1.3.5 Operations and Maintenance

The solar panels are expected to be in operation during daylight hours, seven days per week, 365 days per year. During project operation, no major physical disturbances are expected to occur. Moving parts of the solar array would be restricted to the east-to-west facing tracking motion of the solar modules, an approximate movement of less than one degree every few minutes. At sunset the modules would track to stow position.

Operational activities include:

- maintenance of transformers, inverters, or other electrical equipment
- road and fence repairs
- mechanized vegetation management
- weed management as needed
- site security
- project operations control (remote)

Once operations ensue, no more than one to three vehicles per day Monday through Friday and one Saturday and Sunday are anticipated to visit the site as needed for scheduled/preventative maintenance or emergency repair activities. Routine maintenance work would typically occur during daylight hours. Any work that might interfere with power production may occur in early evening hours. For more complex activities, additional workers and vehicles may be temporarily on-site.

The primary source of water use during operations would be annual panel washing which will utilize approximately 58,000 gallons of water per wash per year. Panel washing would take place primarily during early morning hours or late in the day, avoiding “peak” sun/heat hours, to minimize evaporation and impacts to generation. A temporary crew of up to 12 people along with

water trucks would be brought on-site to complete the washing. Runoff from washing panels is not expected to be generated by the washing process.

In addition to maintenance personnel present at the site as needed, the Project would be monitored remotely on a 24 hour-a-day, seven-day-a-week basis to identify any security or operational issues. In the event a problem is discovered during non-working hours, a repair crew or law enforcement personnel would be contacted if an immediate response is warranted.

The Project operations and maintenance facility would be comprised of 5 Conex units to be located within the footprint of the proposed laydown area. A gravel parking area would also be maintained in this area. The remainder of the laydown area would be reseeded with native or typical noninvasive vegetation.

1.3.6 Project Permits

The Hunter Solar, LLC Project would be compliant with the following Federal, State, and local regulations outlined in Table 2.1-2.

Table 2.1-2. Hunter Solar, LLC Permits and Compliance

Agency	Permit, Regulatory Compliance, or Coordination
Federal	
US Fish and Wildlife Service (USFWS)	Section 7 of the ESA, Migratory Bird Treaty Act of 1918, and Bald and Golden Eagle Protection Act of 1972
US Army Corps of Engineers (USACE)	Sections 401 and 404 of the CWA and Section 10 of the Rivers and Harbors Act of 1899
US Department of Agriculture USDA – Natural Resources Conservation Service (NRCS)	Farmland Conversion Form – Form AD-1066
State	
Colorado Department of Public Health and Environment (CDPHE)	National Pollutant Discharge Elimination System (NPDES) Permit for construction activities Section 401 of the CWA
Colorado Parks and Wildlife (CPW)	Colorado Threatened and Endangered Species
Colorado Office of Archeology and Historic Preservation (OAHP)	Section 106 of the NHPA Consultation, Colorado State Agency Historic Resources Preservation Act
County	
Arapahoe County, Colorado	Solar Energy System Ordinance - Special Use Permit
Arapahoe County, Colorado	Access Permits
Arapahoe County, Colorado	Building Permit

1.3.7 Decommissioning and Reclamation

The Project would operate for approximately 40 years. At the end of the useful life, Hunter Solar, LLC would assess whether to cease operations at the site or replace equipment and continue operations. Should operations cease at the site, the Project would be decommissioned and dismantled and the Project site restored, this process would take approximately 12 months. In general, the majority of decommissioned equipment and materials would be recycled. Materials that cannot be recycled would be disposed of at approved facilities.

General decommissioning and reclamation activities are described below. Decommissioning activities typically include:

- Dismantling and removal of aboveground equipment (solar panels, panel supports, transformers, project substations, etc.) to a depth of 5 feet;
- Removal of below ground electrical connections and utilities up to a depth of 24 inches per the lease agreements with the landowners;
- Removal of pilings;
- Break-up and removal of concrete pads and foundations;
- Removal of access roads unless designated in writing by the Landowner;
- Stabilization of site soils per National Pollutant Discharge Elimination System (NPDES) construction permit (if required for decommissioning activities); and
- Scarification (loosening) of compacted areas within and contiguous to the solar facility.

CHAPTER 2

2.0 ALTERNATIVES EVALUATED INCLUDING THE PROPOSED ACTION

This chapter describes the Project and each alternative evaluated (including the Proposed Action and the No Action Alternative), as required by NEPA. These details serve as the basis for the environmental impact assessment presented in Chapter 3.

2.1 PROJECT DESCRIPTION

The proposed Project is a 75 MW alternating current (AC) solar photovoltaic (PV) generation facility located on undeveloped, agricultural land in Arapahoe County, Colorado. The proposed Project location is illustrated on Figure 1.1-1.

2.2 PROJECT ALTERNATIVES CONSIDERED BUT ELIMINATED

Hunter Solar, LLC, identified Colorado as a promising potential market for solar farms in 2017, due to the low number of such facilities in the state at that time. One of the most significant factors enabling solar development in this region has been the dramatic decline in the cost of large solar systems, due to a combination of improving technology, equipment and installation methods.

Hunter Solar, LLC initiated a preliminary site review to identify potential locations for development of a solar facility based on the following siting criteria:

a. Solar Assessment – Hunter Solar, LLC used desktop analysis to understand the solar resource and to determine the locations with best solar resource within the state. This analysis helped to show the economics of the project compared to others by estimating production and thus revenue forecasts.

b. Existing Infrastructure – To minimize interconnection costs and environmental impacts of new transmission corridors, Hunter Solar, LLC located the project adjacent to existing electrical infrastructure.

c. Land Availability – Hunter Solar, LLC evaluated property surrounding existing electrical infrastructure. Large open areas are necessary for utility-scale solar facilities. Agricultural land is ideally suited for solar farms. Prospective landowners were visited to gauge interest and support of the Project. Community support was also evaluated.

d. Environmental Concerns – A site suitability tool was run to screen for environmental factors including, but not limited to, wetlands, waterways, trees, critical habitat, endangered species and animals, and hydric soils. The Project site selected for consideration showed few environmental factors, and, those factors identified could be avoided by strategic placement of the Project components. Potential sites with more numerous environmental factors and/or factors which could not be avoided were eliminated from consideration. Hunter Solar, LLC preferred to site and design projects to avoid and minimize impacts to wetlands, important habitat, and other sensitive environments to the extent practicable.

e. Load Flow Analysis – As a part of the initial assessment of suitable sites, electrical load flow studies of existing electrical infrastructure helped determine whether significant transmission system upgrades would be necessary or significant costs to connect to existing substations.

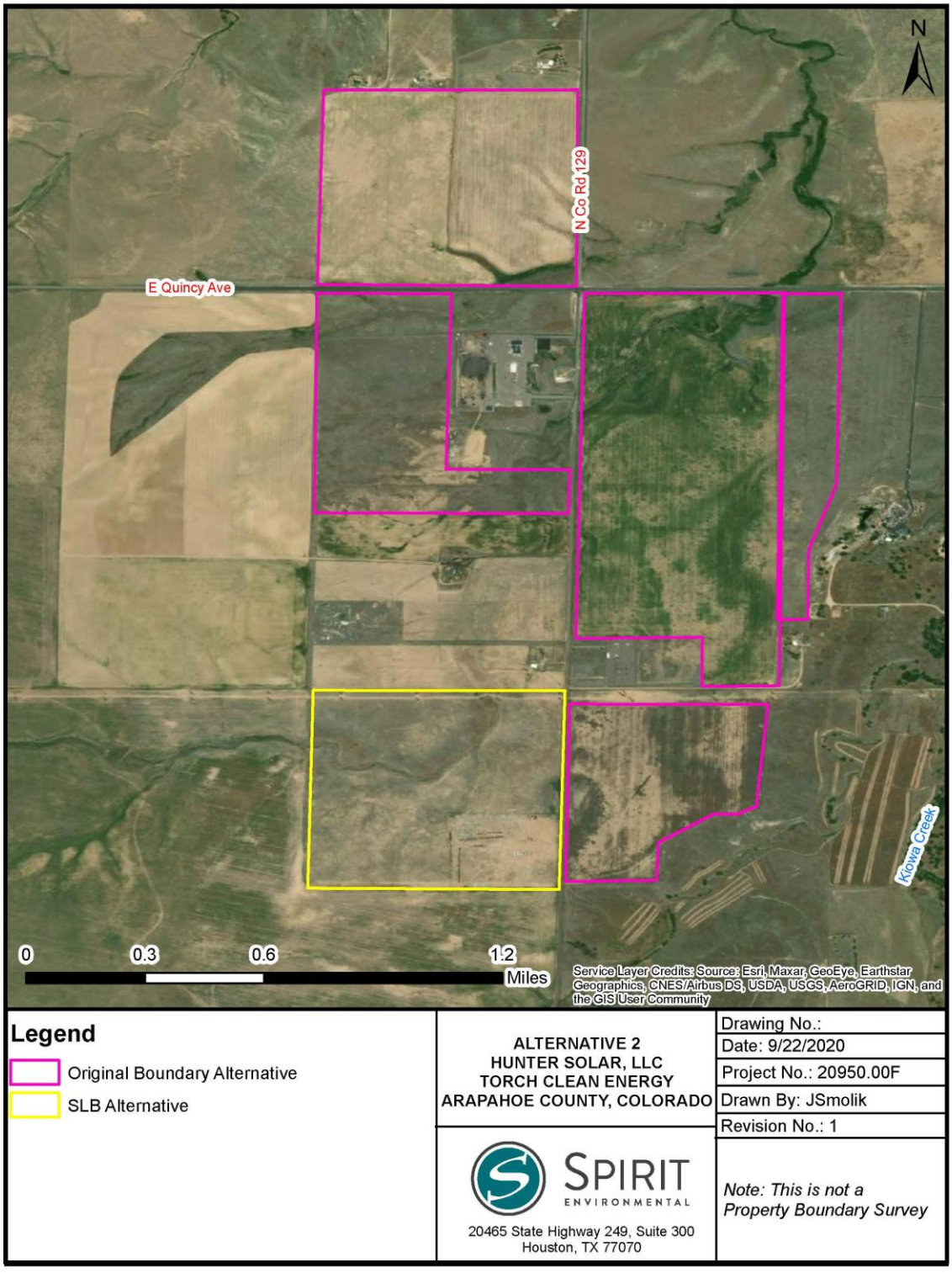


Figure 2.2-1. Original Project Boundary and SLB Parcel Shown in Yellow

2.2.1 State Land Board Alternative

The Applicant evaluated a lease option agreement (A Planning Lease per the Colorado State Land Board [SLB]) with the State Land Board for the NE ¼ of Section 17. Environmental and soils studies were conducted on the 156-acre State Land Board parcel. Results of the studies concluded that the soils were unstable in addition the southeast corner of the quarter section contains burrowing owl habitat. Due to the environmental impacts to soils and the burrowing owl habitat, this alternative was dismissed from further consideration.

2.2.2 Adjacent Lands Alternative

The Applicant evaluated adjacent land in the vicinity of the Project Site. This alternative would require environmental analysis and development of a solar facility on a parcel or parcels other than the selected parcels. The parcels to the east included the home of a landowner who was not interested in having the facility in close proximity to their home. The parcels to the south included the Kiowa Creek drainage which constrains the area in which solar panels can be installed. The parcels to the west would be further from the substation and require easements or crossing agreements to get the power across lands between those parcels and the point of interconnection. The parcels to the northeast did not include an interested landowner party. The adjacent parcels in this project site did not have favorable conditions for development and/or did not include landowners interested in participating in a lease agreement. The studies performed on the State Land Board parcel indicated it would not be a feasible site for solar development. This alternative would not allow for the construction and operation of a solar electric facility that would increase the amount of renewable electrical energy servicing the local electrical grid. Due to the aforementioned constraints, this alternative was dismissed from further consideration. Please see Section 2.3.1.

2.3 PROJECT ALTERNATIVES CARRIED FORWARD FOR ANALYSIS

In 2017, following the Siting Area selection process described in Sections 2.2, Hunter Solar, LLC began development of the original 741.8-acre project area. Hunter Solar identified existing transmission infrastructure and a target area of approximately 860 acres for site control through lease option agreements. Concurrent with site control efforts, Hunter Solar, LLC completed desktop reviews and field surveys to identify environmental, wildlife, and cultural resources. In March 2017, Hunter Solar submitted an interconnection application and security deposit to IREA, thereby initiating the interconnection study process to analyze the impact of injecting the electricity produced by the Project into the IREA transmission system. Consultations with agencies and field studies for wildlife, plant species, and wetland delineations began in 2017. In February 2018, Arapahoe County approved the Project's Special Use Permit (1041/USR) for the original project area.

In 2020, Hunter Solar, LLC submitted local land use permit applications for the inclusion of the 316-acre Geller Land Addition. Hunter Solar, LLC evaluated the suitability of the site to create an adequate array orientation and the results of the environmental studies indicated that the site supports the appropriate soils for construction of the project. An evaluation of wetland and water resources indicated that there are two isolated palustrine emergent wetland (PEM) wetlands and one potentially non-jurisdictional ephemeral drainage within the Geller Land addition. The wetlands and ephemeral drainage will not be impacted by construction. Since the Geller Land Addition results in the least amount of environmental impacts, this alternative was chosen as the Preferred Alternative.

Of the original 741.8-acre project area and the 316-acre Geller Land Addition, Hunter Solar, LLC plans on developing approximately 571 acres.

The Project began detailed engineering design, layout optimization and procurement of equipment in 2019. The high-level goal of this detailed design phase was to maximize the solar output while minimizing environmental impacts and the area of land cover. The most important factor that changed the expected amount of land required for the Project was the commercial availability of bifacial solar panels starting in 2020. Bifacial solar panels have solar energy cells on both the front and back sides of the panels. This allows solar energy to be collected on both sides of the panel, enhancing energy output of the solar energy system. By utilizing bifacial panels, the Project footprint was able to be reduced to approximately 571 acres, while still achieving the 75 MW output required under the Power Purchase Agreement and meeting Hunter Solar, LLC's purpose and need.

Hunter Solar, LLC has established queue positions and obtained a combination of land leases and easement agreements with landowners for the parcels included in the Proposed Action footprint. Following completion of final Project design, Hunter Solar, LLC would release any land not required for the Project back to the land owners.

2.3.1 Proposed Action Alternative

The Proposed Action includes the construction of the Hunter Solar, LLC Project on approximately 571 acres in Arapahoe County, Colorado as shown in Figure 2.3-1. Permanent and temporary disturbance areas for the Proposed Action are depicted in Table 2.3-1.

The entire Project area would potentially be subject to grading, and/or ground-disturbing activities, as well as mowing and light surface preparation (including grubbing of existing vegetation) similar in nature to current on-site agricultural activities.

Table 2.3-1. Total Disturbance Areas on the Hunter Solar, LLC Site

Feature	Type of Impact	Acres
Total Inside Fenced Areas	Permanent	555.4
Operations and Maintenance Center	Permanent	0.0
Substation	Permanent	0.0
Transmission ROW	Permanent	0.2
Access Roads Outside of Fence	Permanent	10.1
Total Permanent Disturbance	Permanent	**565.7**
Transmission Buffer	Temporary	4.6
Wireline ROW	Temporary	0.0
Laydown	Temporary	1.6
Total Temporary Disturbance	Temporary	**4.6**
Total		**570.3**

2.3.1 No Action Alternative

Under the No Action Alternative, RUS would not provide funding for the Hunter Solar, LLC Project and the Project would seek other financing sources. For the purposes of this analysis, it is assumed the Project would not be constructed. This provides a baseline comparison for the impacts analysis in this EA. Assuming the Project would not be constructed, Hunter Solar, LLC would relinquish their lease on the parcels comprising the proposed Project Site. Existing conditions would likely remain unchanged (i.e., property would remain as predominantly-disturbed agricultural land) and agricultural activities would likely continue. Under the No Action Alternative, there would be no project-related changes to land use, natural resources, or socioeconomics in the immediate future.

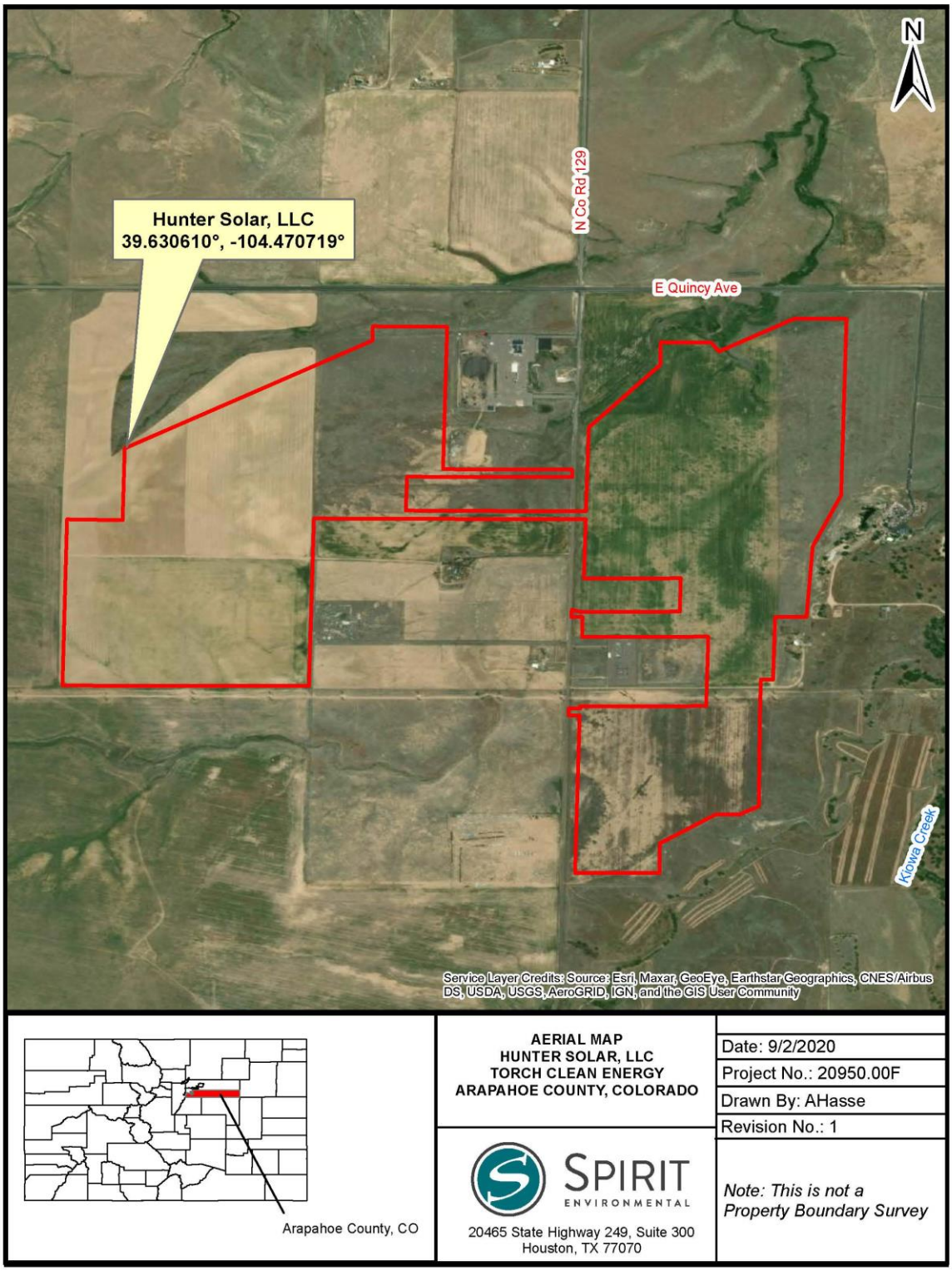


Figure 2.3-1 Hunter Solar, LLC Proposed Action

CHAPTER 3

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The affected environment is discussed for the Proposed Action, shown on Figure 2.2-5 and referred to as the Project Site. Environmental consequences for the Proposed Action and No Action Alternatives are discussed below.

3.1 LAND USE

This section describes existing land use within and surrounding the Project Site as well as potential impacts to land use associated with the Proposed Action and No Action Alternative. The Project Site is located Arapahoe County, Colorado, located approximately 8.5 miles south of the Town of Bennett in Arapahoe County or approximately 19 miles north of the town of Kiowa in Elbert County, Colorado (Figure 3.1-1).

3.1.1 Affected Environment – Land Use

General Land Use

Land use describes the way people use and develop land. Zoning ordinances organize land into categories such as undeveloped, agricultural, residential, and industrial. These ordinances in addition to planning documents are utilized by many municipalities to guide the direction of development and to keep similar land uses together. The Project Site is located in unincorporated Arapahoe County.

The 2018 Arapahoe County Comprehensive Plan was reviewed to assess the Proposed Action's compatibility with policies and strategies regarding alternative energy sources and solar facility development within Arapahoe County (Arapahoe County 2020). The following policies and strategies were identified:

Policy or Strategy:	Policy NCR 6.2 – Encourage the Development and Use of Alternative Energy Sources
Decision:	"The County will encourage alternative energy companies to develop facilities and generate energy from alternative sources. The County will encourage the use of energy from alternative sources by residents, businesses and utility companies."
Policy or Strategy:	Strategy NCR 6.2(a) – Encourage the Development of Solar Energy Facilities
Decision:	"The County provides an Administrative Use by Special Review procedure for solar facilities generating less than two megawatts and less than 20 acres in size. The County will continue to use this administrative process to encourage solar facilities in the County. Facilities larger than 20 acres and generating more than two megawatts require review at a public hearing."

Policy or Strategy:	Strategy NCR 6.2(b) – Establish Standards for Solar Farms
Decision:	"The County will amend the Land Development Code to adopt standards for solar facilities in excess of 20 acres and generating more than 2 megawatts of power. Standards should address the size and spacing of solar farms along with impacts to surrounding land uses and wildlife."

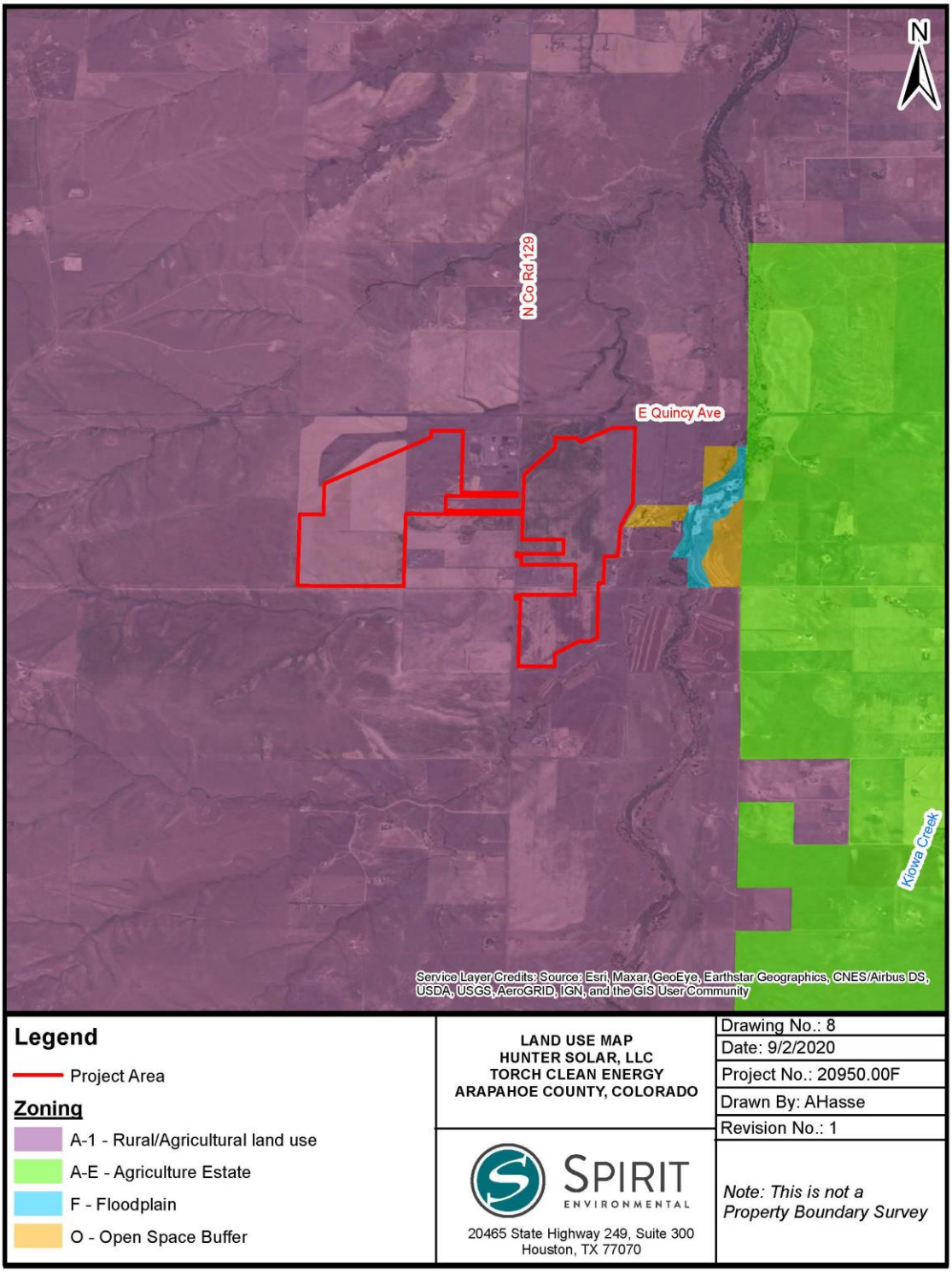


Figure 3.2-1. Land Use Map

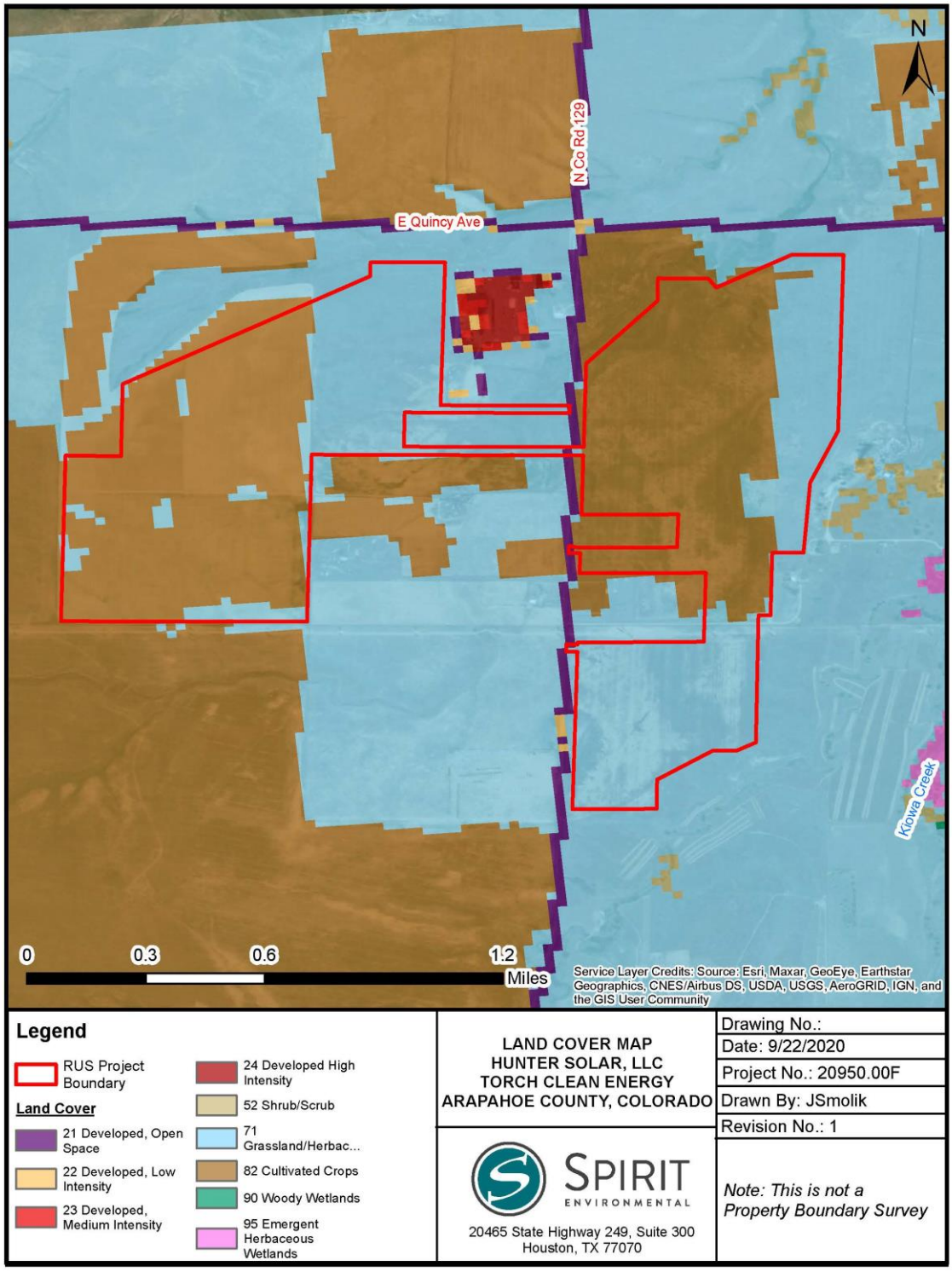


Figure 3.2-2. Land Cover Map

According to the National Land Cover Database (NLCD), the Project Site is comprised mostly of cultivated crops and grassland/herbaceous vegetation (Figure 3.2-1). NCLD land cover analyses are based on satellite image interpretation which may not fully capture ground conditions on a fine scale. The Project Site consists of relatively flat terrain with small hills and depressions. The elevation ranges from approximately 5,749 to 5,850 feet above msl (USGS 2020).

Land use in the vicinity of the Project Site primarily agricultural with cultivated crops, grassland/herbaceous vegetation, and sparse, low-intensity residential development.

The Project Site is located in unincorporated Arapahoe County, Colorado. The Hunter Solar Project will not result in an unreasonable risk of releases of hazardous materials. The Spill Prevention Control and Countermeasures (SPCC) will be provided prior to applying for the building permit. Standard construction phase erosion and sedimentation controls will be employed to eliminate dust, store any construction waste, and minimize stormwater impacts during construction. No impacts are anticipated for this review item and no Recognized Environmental Conditions (RECs) were identified. The SPCC plan will be submitted with a building permit application and will be stored onsite.

Hunter Solar, LLC and its subcontractors would maintain the site in a clean, neat and safe condition. As the work progresses, materials, tools, waste materials, rubbish and debris will be removed accordingly. Water used to clean tires as vehicles are exiting the construction site, to prevent the spread of noxious weeds, will be brought in using off-site water trucks. Hunter Solar, LLC and its subcontractors will incur all costs of clean-up.

All equipment and materials used to provide operation and maintenance to Hunter Solar will be hauled in by the company or its subcontractors and all waste created as a result will be hauled to necessary recycling or waste facilities by the same party.

Important Farmland

Prime farmland, as defined by the USDA, "is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses". Farmland of statewide importance, although not Federally-recognized as prime farmland, also produces yields of food, feed, fiber, forage, and oil seed crops. This farmland is designated by individual states (NRCS 2020).

As shown in Table 3.1-1, none of the eight soils present within the Project Site are classified as Prime Farmland; however, 13.3 acres of prime farmland if irrigated and 12.1 acres of farmland of statewide importance are located in the Project Site. The soils map for the Project Site is included in Figure 3.1-1.

Table 3.2-1 provides a summary of farming statistics (including the number of farms and corresponding acreages that farms comprise) in Arapahoe County as well as the State of Colorado

for comparison. The table also includes changes to the number of farms and the total acreage of farms from 2012 to 2017 (USDA 2020).

Table 3.1-1. 2017 Farming Statistics for Arapahoe County, Colorado

	Number of Farms	Percentage of Total Area in Farms	Land in Farms (Acres)	Percent Change from 2012 to 2017	
				Number of Farms	Land in Farms (Acres)
Arapahoe County	851	54.9	282,912	13	(Z)
Colorado	38,893	47.72	31,820,957	7	(Z)

Source: USDA 2020

Formally Classified Land

Hunter Solar, LLC conducted a review of the potential for formally classified lands within the vicinity of the Proposed Action. Based on the review, there are no formally classified lands within the vicinity of the Project Site. The following land areas were reviewed:

- National Parks and Monuments
- National Forests and Grasslands
- National Historic Landmarks
- National Battlefield and Military Parks
- National Historic Sites and Historical Parks
- National Natural Landmarks
- National Wildlife Refuges
- National seashores, lake shores, and trails
- Wilderness areas
- Wild, scenic, and recreational rivers
- State parks
- Local recreation areas
- State fish and wildlife management areas
- Bureau of Land Management ("BLM") administered lands
- Native American owned lands and leases administered through the Bureau of Indian ("BIA") Affairs

3.1.2 Environmental Consequences – Land Use

General Land Use

Impacts to land use are anticipated within the approximately 571-acre Project Site. The Project would be constructed, operated, and maintained on an approximately 571-acre site. Of the 571

acres, approximately 160 acres are being cultivated for wheat. Land use on the Project Site would be converted from primarily agricultural to industrial use; however the zoning would remain agricultural. The layout of the Proposed Action is shown in Figure 2.3-1. Prior to construction, all necessary Federal, State, and local construction and zoning permits would be obtained. The surrounding area is largely agricultural and undeveloped with some low-density residential, agricultural, and industrial development. The Proposed Action would have a minor adverse impact on land use during the course of the project lifetime as a relatively small portion of the very large land agricultural land use in the vicinity of the Project Site would be lost. Removal of aboveground equipment, concrete pads and foundations, pilings, and below ground electrical connections from the Project Site would result from decommissioning. The majority of the Project site could be returned to agricultural use due to reclamation activities, including breaking up soil in compacted areas. Indirect effects on land use are not anticipated as a result of these activities.

Important Farmland

The FPPA (7 United States Code [U.S.C.]§ 4201 et seq.), requires that Federal agencies consider the effects of their actions on prime or unique farmlands. The purpose of the FPPA is "to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses." Table 3.1-1 shows the acreages associated with "prime farmland if irrigated" and "farmland of state importance" that would be impacted by the Proposed Action. Should the Proposed Action be implemented, approximately 75.9 acres (13.3% of the Project Site) of "prime farmland if irrigated" and approximately 69.2 acres (12.1% of the Project Site) of farmland of statewide importance on the Project Site would be converted to nonagricultural use, and farming for the duration of site operations would be precluded. Activities within the Proposed Action would result in the loss of some farmland soils through grading and excavation activities; however, the integrity of the majority of soils within the Project Site would remain in place as the Proposed Action will require minimal ground disturbance. If the solar facility would be decommissioned and reclaimed in the future, prime farmland within the Project Site could potentially be used again for agricultural purposes with no anticipated long-term loss of soil productivity. It is possible that areas of soil degradation could potentially see some degree of soil regeneration.

The Farmland Conversion Impact Rating (Form AD-1006) was submitted to the USDA NRCS (Appendix A). As of this time, the Farmland Conversion Impact Rating for the proposed Hunter Solar, LLC Site the NRCS concurred that the project will have no impacts on prime farmlands. Under the FPPA, projects with a total impact rating score below the threshold value of 160 do not require further consideration. For projects with scores greater than or equal to 160, the FPPA may require mitigation including the following:

- Minimizing impacts by limiting the degree or magnitude of the action and its implementation;
- Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment; and
- Reducing the impact over time by preservation and maintenance operations during the life of the action; and compensating for the impact by replacing or providing substitute resources.

- Because the majority of the Proposed Action site does not consist of prime farmland or farmland of statewide importance, Hunter Solar, LLC did not consider alternative sites.

As described in Section 3.2.2.1, zoning would remain agricultural. The Proposed Action may have adverse impacts to "prime farmland if irrigated and "farmland of statewide importance". While the Project may have adverse impacts on "prime farmlands if irrigated" and farmland of statewide importance, the effects of this alternative will not be "irreversible" per 7 CFR part 658 of the FPPA; therefore, it is exempt from the FPPA and the Farmland Conversion Impact Rating form AD-1006. Indirect impacts from the Proposed Action are not anticipated for prime farmland.

The Proposed Action would conform agreements between Hunter Solar, LLC and the landowners to ensure the long-term stability of the site soils and preserve the potential for the site to be used for agricultural purposes again at a future date.

Formally Classified Lands

The Proposed Action is located on privately-owned, agricultural land in Arapahoe County, Colorado. The Proposed Action is not anticipated to produce significant impacts to areas outside the immediate Project Site. There are no formally classified lands within five miles of the Project Site; the Proposed Action would not have any direct or indirect impacts on these resources. Furthermore, the Proposed Action would also have no impact on Federal, state, or local recreation resources.

There are no Federal or state parks, natural areas, or recreation areas within the Project Site or within a five mile radius of the Project Site; however, the area immediately east of the Project Site is zoned as "open space buffer" (US Environmental Protection Agency [EPA] 2020a).

3.2 FLOODPLAINS

A floodplain is relatively low land, located near a river, that is subject to periodic flooding. The 100-year floodplain is defined as the area subject to a one-percent chance of flooding in any given year is normally. A 500-year floodplain refers to areas subjected to a 0.2-percent chance of flooding in any given year are normally. It is necessary to evaluate development in the floodplain to ensure that the Project is consistent with EO 11988, Floodplain Management.

The EO requires that Federal agencies avoid the 100-year floodplain unless there is no practicable alternative. According to the EO 11988, the objective for Floodplain Management, is "…to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative" (EO 11988, Floodplain Management). The purpose of the EO is to create a consistent government policy against floodplain development in most circumstances; however, it is not intended to prohibit floodplain development in all cases (US Water Resources Council 1978).

3.2.1 Affected Environment – Floodplain

The Federal Emergency Management Agency (FEMA) designates zones (including the 100-and 500-year flood zones) which show the likelihood of an area flooding. According to FEMA Flood Insurance Rate Map (FIRM) Community Panel Number 08005C0265K, effective December 17, 2010, the Project Site is located in Zone X. The Proposed Action falls outside of the 100- and 500-year zones. According to the FIRM map, the Project Site has less than a 0.2 percent chance of flooding annually (Figure 3.3-1; FEMA 2010). The nearest Special Flood Hazard Zone, which is associated with Kiowa Creek, is located approximately 0.33 miles east of the Project Site.

3.2.2 Environmental Consequences – Floodplain

The Proposed Action has been planned to avoid and minimize impacts to sensitive areas, including floodplains. The nearest Special Flood Zone Hazard, which is located approximately 0.33 miles east of the Project Site, is associated with Kiowa Creek (see Appendix B). As a result of the Proposed Action, no impacts to the floodplain are anticipated. Downstream water quality construction may result in indirect impacts; however, these impacts are anticipated to be minor and beneficial with regard to surface water quality as described in Section 3.3.2.

Minor, beneficial, indirect impacts from the change in land use and the reduction in the amount of fertilizer and pesticide/herbicide are anticipated for runoff surface water quality. This will result in the reduction of disturbance activities on the Project Site including erosion and sedimentation. These indirect impacts to surface water would have similar impacts for downstream floodplains.

Future development to enhance, serve, or service the Project Site could result in indirect impacts to floodplains. Arapahoe County, Colorado complies with the National Flood Insurance Program (NFIP); therefore, development must be comply with floodplain management and permitting ordinances. Compliance with these ordinances, will ensure that impacts on the floodplain, as well as to development constructed within the floodplain, would be minimal.

3.3 WETLANDS

Under the Clean Water Act (CWA), both wetlands and waterbodies may be considered Waters of the U.S. (WOTUS). Activities in WOTUS, including wetlands, are regulated by the USACE under Section 10 of the Rivers and Harbors Act (RHA) and Section 404 of the Clean Water Act (CWA). Section 10 of the RHA applies to all navigable WOTUS and those waters that are subject to the ebb and flow of tides, including any wetlands located below the mean high water (MHW) line of tidal waters. Section 404 of the CWA applies to all WOTUS as defined in the Navigable Waters Protection Rule (NWPR) that went into effect June 22, 2020. Under the NWPR, four clear categories of waters are regulated:

1. The territorial seas and traditional navigable waters,
2. Perennial and intermittent tributaries to those waters,
3. Certain lakes, ponds, and impoundments, and

4. Wetlands adjacent to jurisdictional waters.

It is unlawful under the CWA to discharge dredged or fill materials into WOTUS without a permit (33 U.S.C. S1311(a). Wetlands "bordering, contiguous [to] or neighboring" WOTUS even when they are "separated from [such] waters…by man-made dikes…and the like are defined as "adjacent". Only the USACE has the final and/or legal authority to confirm the presence and boundaries of WOTUS. USACE jurisdiction over wetlands under the CWA revolves around the fact that wetlands perform critical functions for physical and chemical integrity of wetlands/waterways such as pollutant trapping, flood control, and runoff storage.

The USACE defines wetlands as areas that are inundated or saturated by surface or groundwater at a frequency or duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. An area is a wetland if it meets three criteria including: wetland hydrology, hydrophytic vegetation, and hydric soils as established in the 1987 USACE Wetland Delineation Manual (Environmental Laboratory 1987).

3.3.1 Affected Environment – Wetlands

Potentially jurisdictional and non-jurisdictional wetlands and streams are mapped and classified by the U.S. Fish and Wildlife Service (USFWS). These wetlands and streams are mapped using the National Wetlands Inventory (NWI). The results of this inventory must be confirmed by field survey. After wetlands and streams are confirmed in a field survey it is up to the USACE to confirm if wetland and stream features found in the Project Area are jurisdictional. According to the USFWS NWI mapper, the Project Site contains the following features one (1) PEM1A (Palustrine, emergent, persistent, and temporary flooded) wetland feature, one (1) PUBF (Palustrine, unconsolidated bottom, semi-permanently flooded) pond feature, two (2) R4SBC (Riverine, intermittent, streambed, seasonally flooded) riverine feature, and one (1) PF (Palustrine, farmed) other feature (Cowardin 1979). These waterways include noncontinuous flows from Kiowa creek to the north (Figure 3.3-1).

Two wetland delineations were performed that overlap the Project Site. The surveys were completed in accordance with the 1987 Corps of Engineers Wetlands Delineation Manual ("1987 Manual") and the applicable Regional Supplement. The project area is located on the cusp of two (2) Regional Supplements; the Great Plains Region (2010), and the Western Mountains Valleys and Coast Region (2010). Analysis of climate, physiography, and biotic communities present onsite informed the decision to utilize the Great Plains Region – Version 2.0 ("Regional Supplement") for the delineation, with some deviations as described in the attached wetland delineation reports in Appendix C.

The wetland delineation for the original 741.8-acre Project Site was completed in June and August 2017 (Spirit 2017a). On May 13, 2020, Spirit scientists conducted a wetland delineation for the 316-acre Geller Land Addition (Spirit 2020a). Please note that the survey boundaries for both

wetlands delineations do not reflect the current Project Site. As such, there are wetland features described in the wetland delineations that fall outside of the Project Site.

Delineated streams, wetlands, and ponds will be avoided by the Proposed Action. An Approved Jurisdictional Determination was received for the original project area (2017 delineation) and a No Permit Required (NPR) request was sent to the USACE for approval for the Project site.

To meet the Federal definition of a wetland, the following three (3) indicator parameters are used: hydrophytic vegetation, hydric soils, and hydrological characteristics.. These wetland criteria were recorded at selected data points within the Project Site. According to wetland data from field surveys, common wetland hydrologic indicators in the Project Site included oxidized rhizospheres on living roots, geomorphic position, and FAC-neutral test. Hydric soils can be classified by hydric soil indicators are defined as a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions. Common hydric soil indicators in the Project Site included depleted matrix or redox dark surfaces. Common vegetation within wetlands in the Project Site included broadleaf cattail (*Typha latifolia*), cheat grass (*Bromus tectorum*), creeping thistle (*Cirsium arvense*), common sunflower (*Helianthus annuus*), and field penny-cress (*Thlaspi arvense*).

Table 3.3-1. 2017 Wetland and Waterbodies Table

Feature Name	Report Year	Feature Type	Size (Acres)	Length (Linear Feet)	USACE Verified
Wetland 1	2017	PEM Wetland	0.67	-	Yes
Wetland 2	2017	PEM Wetland	0.23	-	Yes
Wetland 3	2017	PEM Wetland	0.01	-	Yes
Wetland 4	2017	PEM Wetland	0.04	-	Yes
Waterbody 1	2017	Freshwater Pond	0.006	30	Yes
Waterbody 2	2017	Ephemeral Drainage	0.003	33	Yes
Waterbody 3	2017	Ephemeral Drainage	0.014	100	Yes
Waterbody 4	2017	Ephemeral Drainage	0.002	24	Yes

Feature Name	Report Year	Feature Type	Size (Acres)	Length (Linear Feet)	USACE Verified
Waterbody 5	2017	Ephemeral Drainage	0.004	32	Yes
Waterbody 6	2017	Freshwater Pond	0.033	51	Yes
Waterbody 7	2017	Freshwater Pond	0.001	53	Yes
Waterbody 8	2017	Ephemeral Pond	0.051	1116	Yes
Waterbody 9	2017	Ephemeral Pond	0.003	120	Yes
Waterbody 10	2017	Ephemeral Pond	0.005	230	Yes
Waterbody 11	2017	Ephemeral Pond	0.009	200	Yes
Waterbody 12	2017	Ephemeral Pond	0.009	195	Yes
Waterbody 13	2017	Ephemeral Pond	0.001	58	Yes
Waterbody 14	2017	Ephemeral Pond	0.003	145	Yes
Wetland 1	2020	Palustrine Emergent	0.08	-	No
Wetland 2	2020	Palustrine Emergent	0.01	-	No
Waterbody 1	2020	Ephemeral Drainage	0.02	671	No
Totals			1.204	3058	-

3.3.2 Environmental Consequences – Wetlands

Wetlands found within the original 741.8-acre project area and the 316-acre Geller Land Addition will be avoided by the Proposed Action; therefore, direct impacts to jurisdictional and non-

jurisdictional wetlands are not anticipated as a result of construction and operation of the solar facility.

Land zoned as agricultural in Arapahoe County has front and side setbacks of 100 feet and rear setbacks of 50 feet. Surface waters will not be filled or altered as a result of the Project.

Hunter Solar, LLC submitted a NPR letter to the Omaha District of the USACE. USACE reviewed the letter and confirmed that no permit will be required. If changes, including impacts to potentially jurisdictional waters, are made to the Proposed Action during final design and construction phases, approval from USACE will be required.

Indirect impacts resulting from construction runoff to wetlands may occur as a result of the Proposed Action. These impacts would be similar to those described for surface water resources in Section 3.3.2.1. There is a potential for runoff during construction to be washed from disturbed areas into adjacent waters during rainstorm events. This would adversely impact surface water quality at the Project Site and immediately downstream. The Proposed Action will be in compliance with the Grading Erosion and Sediment Control (GESC) plan.

In addition to the mitigation measures described above to prevent or minimize impacts to surface water, the use of BMPs such as soil erosion and sediment control measures would minimize the potential for increased soil erosion and runoff during construction. Collection and disposal of minimal amounts of hazardous materials generated by the Proposed Action will be in accordance with an approved SPCC plan.

The Project Site was refined to avoid impacts to wetlands and waterbodies. Earlier versions of the project included parcels as well as additional acreage that were dismissed from further consideration as they had greater concentrations of surface water features.

The Proposed Action will not have a direct impact wetlands or waterbodies; therefore, a USACE permit will not be required. Hunter Solar submitted a No Permit Required (NPR) letter to the USACE. As of the date of this report, consultation with the USACE is complete and USACE determined that no aquatic features will be impacted.

The Proposed Action will avoid features that are considered waters of the United States (WOTUS) or wetlands; therefore, no direct impacts to any of the aforementioned features will come from the Project. Indirect impacts may occur to wetlands and WOTUS as a result of construction activities; however, the use of BMPs during construction would minimize these impacts.

3.4 WATER RESOURCES

3.4.1 Affected Environment – Water Resources

Groundwater

Groundwater is located within soils and rock formations beneath the ground surface. An aquifer is a rock unit that has sufficient permeability to conduct groundwater and to allow economically

significant quantities of water to be produced by man-made water wells and natural springs. Aquifers must be permeable and porous while retaining qualities allowing water to flow through it easily to be productive.

The Project Site falls within the area underlain by the Denver Basin aquifer system, which serves as the major source of water for South Metro Denver (Colorado Foundation for Water Education 2017). The Denver Basin aquifer system includes four aquifers: the Dawson, the Denver, the Arapahoe, and the Laramie-Fox Hills. Specifically, the Project Site is located within the Denver aquifer area. Groundwater in the area is anticipated to follow the surface topographic gradient to the east-northeast towards Kiowa Creek. The GeoSearch Water Well reports obtained as part of Phase I Environmental Site Assessments conducted for the Project Site identified water wells located within the original 741.8-acre project area; however, the Proposed Action has no plans to develop additional wells or utilize or otherwise disturb any existing water wells. Therefore, there will be no readily-accessible conduit for potential contaminants to travel from the ground surface down into the aquifer (Appendix D).

Surface Water

The Project site lies within the streamflow segment identified as South Platte hydrologic unit code 101900. A review of USGS topographic maps illustrates unnamed intermittent stream features within both the original 741.8-acre project area and the 316-acre Geller Land Addition; however, these intermittent streams do not extend into the Project Site. No other surface water features are present within the Project Site. Drainage is to the east toward Kiowa Creek, located approximately 0.33 miles east of the Project Site.

Two separate wetland delineations were conducted within the Project Site in June and August 2017. The field studies for the 316-acre Geller Land Addition occurred in May 2020. The two wetland delineation reports are located in Appendix C (Spirit 2017a and Spirit 2020a). It should be noted that the survey boundaries within the two delineation reports do not reflect the current Project Site. Fourteen waterbodies were located within the original 741.8-acre project area. These waterbodies totaled 2,387 linear feet (LF). One waterbody, which totaled 671 LF was identified within the 316 Geller Land Addition. These waterbodies are described in Table 3.3-1. An approved jurisdictional determination was received for the Spirit 2017 delineation and a no permit required letter is has been received for the entire Project Site.

3.4.2 Environmental Consequences – Water Resources

Groundwater

No adverse impacts to groundwater are anticipated as a result of the Proposed Action. The Project Site is located within the Denver Basin aquifer system, an extensive regional aquifer system which supplies groundwater for much of the southern Denver metropolitan area. Although six water wells were identified within the original 741.8 acre project area, these wells will not be utilized and the facility has no plans to develop and/or use any additional wells at the Project Site. Based on this information, there will also be no anticipated impacts to groundwater levels, flow direction, artesian pressure, recharge rates, recharge sources, water storage, or seepage loss.

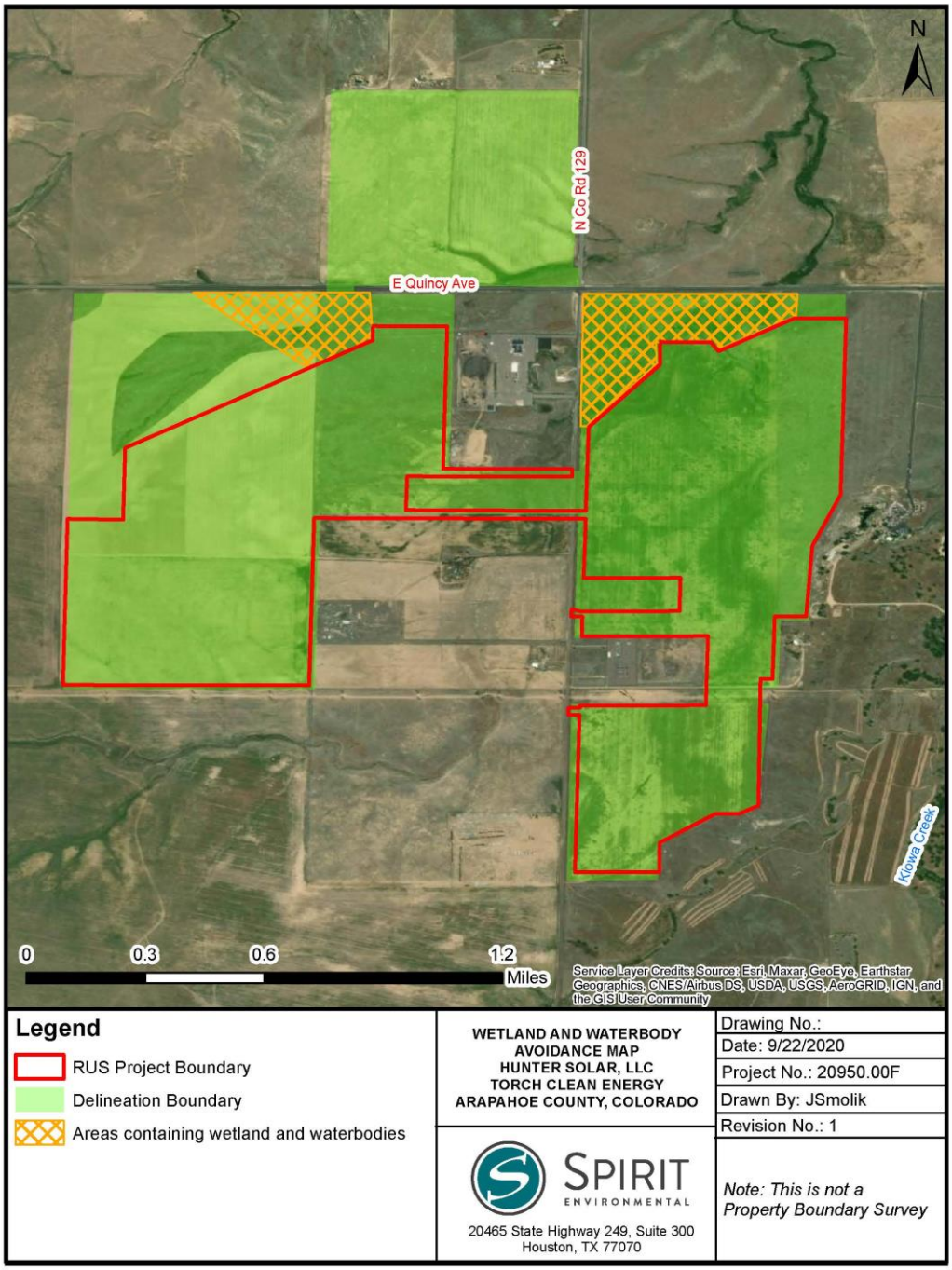


Figure 3.3-1. Wetlands and Waterbodies Map

This project will comply with the requirements of the CWA. A Notice of Intent (NOI) for Colorado Discharge Permit System (CDPS) Permit Number COR400000 would be submitted and a Construction Stormwater Pollution Prevention Plan (CSWPPP) would be prepared and implemented by the Applicant and its contractors/subcontractors to limit sedimentation and erosion impacts to stormwater quality from construction activities. In addition, local stormwater quality permits, as applicable, will be obtained by the Applicant and appropriate stormwater BMPs will be implemented. The CSWPPP will comply with the Southeast Metro Stormwater Authority (SEMSWA) BMPs for stormwater runoff and with the GESC Plan.

It is anticipated that relatively small quantities of fuels, lubricants, and similar materials may be stored onsite during construction. Proper material handling practices and spill prevention and control measures will be instituted along with other BMPs as part of the CSWPPP to protect potential impacts to both surface waters and groundwater. Once constructed, secondary containment and other provisions outlined in the SPCC Plan will protect groundwater from leaks, spills, or other incidental releases.

A maximum of 450 acre feet of water would be required for construction the Proposed Action. This water would either be supplied from a municipal source or brought in by water trucks from an off-site source. As discussed in Chapter 2, it is anticipated that operations will require very little water, and on an infrequent basis. It is assumed that normal rainfall would generally be sufficient to keep the solar panels clean of dust; however, once every year it is anticipated that panel washing might occur; which would require an estimated 58,000 gallons per wash event.

Activities related to the electrical interconnection of the Project Site with the IREA Brickcenter Substation and transmission line would have no adverse impacts on groundwater.

Surface Water

The applicant is avoiding wetlands and waterbodies observed within the original proposed project area, and no wetlands or waterbodies have been identified within the Project Site. Therefore, no surface water quality impacts are anticipated for the Proposed Action..

The Applicant plans to disturb more than one (1) acre of land for the construction of the Proposed Project; therefore, a construction stormwater permit will be required by the CDPHE Water Quality Control Division. As stated in the groundwater section above, an NOI for a CDPS Permit Number COR400000 will be submitted and a CSWPPP will be prepared and implemented by the Applicant and its contractors/subcontractors to minimize sedimentation and erosion impacts to stormwater quality from construction activities. In addition, local stormwater quality permits, as applicable, will be obtained by the Applicant and appropriate stormwater best management practices will be implemented. A total of 30 permanent transformers will placed onsite and temporary fuel and lubricant storage may be present during construction. Fuel and transformer oil will be contained in accordance with applicable regulations and a SPCC plan will be developed to address permanent

oil storage, secondary containment, and release response measures. The plan will comply with the SEMSWA BMPs for stormwater runoff and with the GESC Plan.

Temporary potential impacts are anticipated to occur during the nine to 12-month construction phase; however, the CDPS Permit Number COR400000 is designed to mitigate those impacts.

Temporary impacts are anticipated during grading and construction of the Project Site. Stormwater runoff containing sediments and other potential pollutants from disturbed areas during construction may be washed into adjacent waters during rainstorm events. Development and implementation of BMPs for controlling soil erosion and impacted runoff in accordance with the requirements of CDPS Permit Number COR400000 would minimize the anticipated potential impacts to surface water from construction activities.

Following construction, revegetation of the Project Site and adequate erosion control measures would be implemented to mitigate proposed runoff conditions, including grading and/or terracing to minimize runoff gradient and velocity. No permanent stormwater measures such as detention basins or infiltration swales will be required; however, three small driveway culverts are proposed for access road connections and a box culvert is proposed to cross a drainage from the access road. After construction is complete, no additional impacts to the land area are anticipated. Both during and after construction, no impacts are anticipated to meandering surface water characteristics or limits of any streambeds.

The Project Site has been planned to avoid and minimize impacts to wetlands and WOTUS. The Project Site will avoid more than 3058 LF of wetlands and waterbodies according to the two previously completed wetland delineations. The total acreage of wetlands and waterbodies that will be avoided by the Project Site is 1.204 acres. The Proposed Action would comply with agricultural setbacks in Arapahoe County, which are 100 feet for front and side setbacks of 50 feet for rear setbacks.

As stated previously, a SPCC Plan will be created before operations start in accordance with applicable federal regulations (i.e., 40 CFR Section 112). Permanent oil storage and secondary containment use for temporary storage will be specified, and release response measures will be described in the Plan. A copy of the SPCC Plan will be stored onsite during construction along with the site plan and permits. The County will also receive a copy of the SPCC Plan.

3.5 BIOLOGICAL RESOURCES

This section provides an overview of existing biological resources within the Hunter Solar Project Site. The biological resources that have been analyzed below are vegetation and habitat; wildlife; and rare, threatened, and endangered species.

Desktop investigations were conducted prior to field surveys of the proposed Project Site. Wildlife, vegetation, and threatened and endangered species were researched during the desktop investigations and verified through the field surveys in June and August 2017and May 2020 (for

the 316-acre Geller Land Addition). The results of these efforts are described in this section in accordance with the following legislation protection biological resources listed below.

- NEPA (42 U.S.C. §§ 4321-4347)
- ESA (16 U.S.C. §§ 1531-1544)
- Migratory Bird Treaty Act (MBTA) (16 U.S.C. §§ 703-712)
- Bald and Golden Eagle Protection Act.

3.5.1 Affected Environment – Biological Resources

Biological resources that were assessed for Project Site include vegetation, wildlife, and rare, threatened, or endangered species, migratory birds and invasive species.

General Fish, Wildlife, and Vegetation Resources

Vegetation

The Project Site is located within the Kiowa watershed in the eastern portion of Colorado in Arapahoe County south of the town of Bennett. The Project Site falls within the Land Resource Region (LRR) G – Western Great Plains Range and Irrigated Region (MLRA) 67B – Central High Plains, Southern Part. Local relief. This Proposed Project lies within the Rocky Mountain System and is characterized by an elevation range of 5,000 feet (ft) to 8,000 ft; small mountains in the area are as high as 10,000 ft. This area supports grassland, shrub-grassland, and forestland vegetation (USDA).

The Project Site is located within the Kiowa watershed in the eastern portion of Colorado in Arapahoe County south of the town of Bennett. The site is a mix of short grass prairies and agricultural fields. There are riparian and wetland vegetation surrounding the Project Site. Upon field visits in June and August 2017it was observed that there was a songbird nest on the ground and that portions of the site could also support other ground nesting species of bird or mammal. Another field visit was performed in May 2020 for the 316-acre Geller Land Addition which had similar observation with songbird nests found on the ground and that portions of the Gellar Addition could support other ground nesting species of bird or mammal.

Historical documents suggest the property was used as agricultural/pasture land since as early as 1937 and continues to be occupied by agricultural land today The NCLD land cover discussed in Section 3.2 indicates that the Project Site is comprised mostly of cultivated crops and grassland/herbaceous vegetation. Dominant vegetation that was recorded during field surveys within the 2017 for the original 741.8-acre project area and the 316-acre Geller Land Addition is presented in Table 3.5-1.

Table 3.5-1. Dominant Plant Species Encountered During Field Surveys

Strata	Species Name	Common Name	Indicator Status
Herbaceous	Asclepias speciosa	Showy Milkweed	FAC
Herbaceous	Poa pratensis	Kentucky Bluegrass	FAC
Herbaceous	Bromus arvensis	Field Brome	UPL
Herbaceous	Thlaspi arvense	Field Pennycress	UPL
Herbaceous	Pascopyrum smithii	Western Wheatgrass	FACU
Herbaceous	Calamovilfa longifolia	Prairie Sandreed	UPL
Herbaceous	Carex nebrascensis	Nebrask Sedge	OBL
Herbaceous	Veronica anagallis-aquatica	Water Speedwell	OBL
Herbaceous	Epilobium ciliatum	Willow Herb	FACW
Herbaceous	Rumex stenophyllus	Narrowleaf Knotweed	FACW
Herbaceous	Juncus balticus	Baltic Rush	FACW
Herbaceous	*Bromus tectorum*	Cheatgrass	UPL
Herbaceous	*Cirsium arvense*	Canada Thistle	FACU
Herbaceous	*Onopordum acanthium*	Cotton Thistle	UPL
Herbaceous	*Typha latifolia*	Broadleaf Cattail	OBL
Herbaceous	*Triticum aestivum*	Common Wheat	UPL
Herbaceous	*Cirsium arvense*	Creeping Thistle	FACU

Wildlife

Some of the major wildlife species in MLRA 67B are mule deer (*Odocoileus hemionus*), antelope (*Alcelaphinae*), jack rabbit (*Lepus californicus*), and cottontail (*Sylvilagus*). Bird species likely to occur within the habitats of the Project Site are Canada goose (*Branta canadensis*), scaled quail (*Callipepla squamata*), bobwhite quail (*Colinus virginianus*), and mourning dove (*Zenaida macroura*) (USDA 2006).

As the majority of the Project Site is actively farmed, overall species diversity is expected to be relatively low. Many of the species observed during the site visit are relatively common in the region.

A review of the Project Area using Colorado Parks and Wildlife (CPW) Species Activity Mapping (SAM) data in order to see local wildlife ranges, habitat, and migration patterns. The following species have the possibility of being found within or near the Project Area;

- Black-tailed prairie dog (*Cynomys ludovicianus*)
- Mountain lion (*Puma concolor*)
- Mule deer (*Odocoileus hemionus*)

- Pronghorn (*Antilocapra americana*)
- Swift fox (*Vulpes velox*)
- White-tailed deer (*Odocoileus virginianus*)
- Wild turkey (*Meleagris gallopavo*)

A series of site visits between 2017 and 2020 were conducted for the original Project Area and the Gellar Addition. During these surveys there were observed signs that wildlife was present on site. There were several dens and burrows made by different mammal species observed on site along with wildlife scat from pronghorn.

Federally-listed Threatened and Endangered Species

The ESA of 1973 was designed to protect species (and their habitats) that meet specified criteria for listing by the Federal government as either threatened or endangered. If a species is in danger of extinction in all or a significant portion of the range, it is designated as "endangered". Species that are likely to become endangered in the foreseeable future are designated as "threatened". According to Section 7 of the ESA, if a Federal undertaking may impact "endangered" or "threatened" species, consultation with USFWS or National Oceanic and Atmospheric Administration Fisheries (or both) is required. Effect determinations for each listed species and designated habitat are made according to the following criteria:

- No Effect – the appropriate conclusion when the action agency determines its proposed action will not affect a listed species or designated critical habitat
- May Affect, Not Likely to Adversely Affect – the appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur. Based on best judgement, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur.
- Likely to Adversely Affect – the appropriate finding if any adverse effects to a listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not: discountable, insignificant, or beneficial (see definition of "is not likely to adversely affect"). In the event the overall effect of the proposed action is beneficial to the listed species, but is also likely to cause some adverse effects, the proposed action "is likely to adversely affect" the listed species. If incidental take is anticipated to occur as a result of the proposed action, an "is likely to adversely affect" determination should be made. A "likely to adversely affect" determination requires the initiation of formal Section 7 consultation, under the ESA.

The USFWS Information for Planning and Consultation (IPaC) database was used to identify federal threatened, endangered, candidate, and proposed with potential to occur in the vicinity of the Project Site. The IPaC indicates that no federally-listed critical habitat is mapped within the area surrounding the Project Site. According to the IPaC, Eight (8) federally-listed species have the potential to be affected by the Proposed Action. Of the eight (8) federally-listed species, five (5) (including the least tern [*Sterna antillarum*], piping plover [*Charadrius melodus*], whooping crane [Grus americana], pallid sturgeon [Scaphirhynchus albus], and western fringed prairie orchid [Platanthera praeclara]) may be affected by water-related activities/use in the N. Platte, S. Platte, and Laramie River Basins in Nebraska.

Pallid sturgeon, whooping crane, and least tern are listed as endangered. Piping plover, Mexican spotted owl, Preble's meadow jumping mouse, western prairie fringed orchid, and Ute Ladies' tresses are listed as lhreatened. Appendix E contains the habitat assessment table for federally listed species identified on the IPaC.

Table 3.5-2. Species with Federal Status in the Vicinity of the Project Site

Scientific Name	Common Name	Federal Status
Mammals		
Zapus hudsonius preblei	Preble's meadow jumping mouse	Threatened
Birds		
Sterna antillarum	Least tern	Endangered
Strix occidentalis lucida	Mexican spotted owl	Threatened
Charadrius melodus	Piping plover	Threatened
Grus Americana	Whooping crane	Endangered
Flowering Plants		
Spiranthes diluvialis	Ute Ladies'-tresses	Threatened
Platanthera praeclara	Western prairie fringed orchid	Threatened
Fish		
Scaphirhynchus albus	Pallid sturgeon	Endangered

Spirit field biologists conducted a general habitat survey in conjunction with the wetland and waterbody delineation in June and Augus 2017 and May 2020. No Federally-threatened, endangered, or candidate species were observed at the Project Site.

Federal agencies are required to consult with the USFWS regarding the potential impacts a Federal action could have on listed species under Section 7. These consultations may be informal or formal depending on the nature of potential impacts to listed species. If the Proposed Action has the potential to adversely affect listed species or their critical habitat, formal consultation is required. The habitat survey resulted in a finding of "no effect"; consultation with the USFWS is complete. It was determined that the project will have no effect on sensitive species.

Spirit reviewed the CPW database for threatened and endangered species that may occur within the vicinity of the Project. One species: Burrowing Owl (*Anthene cunicularia*) has potential habitat onsite. The habitat assessment and consultations for the original 741.8-acre project area and the 316-acre Geller Land addition are located in Appendix E.

Migratory Bird Treaty Act (MBTA)

Migratory Birds

During a series of field visits in 2017 and 2020, several bird species were identified along with a ground nest with chicks and there are likely more species that frequent the Project Area. Based on the SAM data, these could include songbirds (i.e., American bittern, black tern, brewer sparrow, grasshopper sparrow, lark bunting), raptors (i.e., ferruginous hawk, golden eagle, northern harrier), and game birds (i.e., ring-necked pheasant, greater prairie chicken, northern bobwhite).

Ground nesting birds are protected under the MBTA may create nests on the Project Area prior to construction. Based on this, typically pre-construction surveys would be conducted to identify if any nests will be disturbed by project construction. If it is necessary to relocate or alter the nests, construction may need to avoid active nests or a permit from the USFWS may need to be obtained. Section 1 of the USFWS Interim Empty Nest Policy states that if the nest is completely inactive at the time of destruction or movement, a permit is not required in order to comply with the MBTA.

Bald and Gold Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA) prohibits the disturbance of eagles; the destruction of both active and inactive nests is also prohibited. Permit programs are available that may allow the project proponent to take an inactive nest or to disturb eagles at an active nest or eagle concentration area. These permits require that avoidance and minimization measures are implemented in coordination with the USFWS and the threshold of take for the regional eagle population has not been exceeded (Department of the Interior 2007).

Bald Eagles (*Haliaeetus leucoocephalus*) and Golden Eagles (*Aquila chrysaetos*) are both found in Arapahoe County, Colorado. Bald Eagles are commonly found near rivers and other bodies of waters where there are fish, waterfowl, or carrion while Golden Eagles prefer to hunt small mammals. Both species nest in tall trees like Eastern Cottonwood (*Populus deltoides*) that is found

water bodies like Kiowa Creek in Eastern Colorado which is 0.25 mile away from the Project Area. Bald and Golden Eagle breeding season lasts from December to July. During this time frame it is important for both species to have minimal impacts from humans like increases in traffic and construction activities.

Field visits in 2017 and 2020 looked for signs of Bald and Golden Eagles activity in and around the Project Area. Habitat, such as trees, were not observed at the Project Site. There were no signs of either species at the time of the surveys, and historical data from the CPW did not show any historical nests within a mile of the Project Area.

If the event that a bald or golden eagle nest is found within the Project Site or the vicinity of the Project Site the USFWS office would be contacted.

Invasive Species

Executive Order 13112 - Invasive Species, requires Federal agencies to not authorize, fund, or carry out actions that are believed to likely cause or promote the introduction or spread of invasive species in the U.S. Additionally, to minimize risk or harm, feasible and prudent measures to should be utilized in conjunction with the action(s).

Invasive species are alien species whose introduction has the potential to cause economic and environmental harm or harm to human health. Non-native invasive plant species can spread into and persist in native plant communities, posing a threat to these communities as well as displacing native plant species.

Colorado's Department of Agriculture works closely with the state's 64 counties to manage noxious weeds. There are three lists of noxious weeds in Colorado (A, B, and C). Species on the A list are set for mandatory eradication throughout the state of Colorado. Species on the B list are set for a minimum of control suppression and may possibly require eradication depending on the size of the infestation in each specific county. Species on the C list are left to the discretion of the County to address if they choose. A list of these species can be found in Appendix E. Due to the disturbed nature of the agricultural fields, there is a potential for invasive species to be present within the Project Site.

3.5.2 Environmental Consequences – Biological Resources

Vegetation

The Project has been planned to avoid and minimize impacts to native vegetation. Construction, operation, and maintenance of the solar facility would result in the short- and long-term loss of native and non-native vegetation. Following the completion of construction, most of the solar facility site would be re-vegetated with both native grasses and other native herbaceous vegetation

in order to minimize wind and water erosion, to provide competition with noxious weeds, and to enhance aesthetics. Long-term loss of native vegetation would be a minor impact because the vegetation types are common in the area and most of the acreage affected by initial grading would essentially be revegetated to a similar species composition upon completion of construction.

For construction of the Proposed Action, grading would be conducted to establish the new access roads, staging/laydown areas, concrete pads, substation, switch yard, and solar array field. The approximately 571 acres would be permanently affected by construction of facility (Figure 3.6-1).

Following construction, the Project Site would be maintained with a seeded with a mixture of native herbaceous vegetation in compliance with the GESC Plan, after construction to minimize erosion. The seed mix, which follows recommendations of the local NRCS office and will be submitted to Arapahoe County for approval. The seed mix is included below:

Table 3.5-3. Seed Mix Used for After Project Reclaimation

Strata	Species Name	Common Name
Herbaceous	Pascopyrum smithii	Western Wheatgrass
Herbaceous	Bouteloua curtipendula	Sideoats Grama
Herbaceous	Bouteloua gracilis	Blue Grama
Herbaceous	Bouteloua dactyloides	Buffalograss
Herbaceous	Nassella viridula	Green Needlegrass

Hunter Solar, LLC would manage the site to control or minimize the spread of state-listed noxious and exotic species. It is important to reduce or eliminate any new weed species from being introduced into or spreading from the Project disturbance areas. Due to the opportunistic nature of invasive and noxious weed species, the disturbance areas have a higher potential for weed species than are currently present within the region. General measures to prevent the spread of invasive species include the following:

- Clean equipment (e.g., air compressors [high pressure] or washing station or offsite cleaning with certification) prior to personnel, vehicles, and equipment each time a vehicle enters the site;
- Ensure that all equipment and materials brought onto the site are weed-seed free via cleaning, inspection, and similar BMPs;
- Limit disturbance areas during construction to the minimum required to perform work
- Limit ingress and egress to defined routes;
- Vegetate temporarily disturbed areas with appropriate native species as soon as possible after construction is complete to prevent weed establishment;
- Use certified weed-free products for erosion control; and

- Employ manual, mechanical, and chemical control methods as appropriate to target species.

The Proposed Action will likely impact native vegetation and agricultural fields. Furthermore, permanent impacts are anticipated for current vegetation. To mitigate erosion and the spread of noxious weeds in disturbed soils, BMPs should be utilized. After construction, it is recommend to use local and native seed mixes be used for the Project Site.

Wildlife

The construction the Proposed Action will cause direct impacts to local wildlife through temporary displacement from previously occupied habitat. Impacts to local wildlife will result in permanent habitat loss within the project boundary, but there is similar suitable habitat surrounding the project that will minimize impacts to displaced wildlife.

The Proposed Action will cause limited direct impacts to wildlife species currently present within the Project Area. The likely activity resulting from the Proposed Action will disturb and impact most species during the construction phase in and around the project boundary. Most species found in and around the project boundary are mobile and can displace to suitable habitat around the Project Site; however there is a possibility that the accidental take of several species could occur from construction activities that would result in the disturbance of vegetation and soil. The possibility of accidental takes of wildlife are more common in reptiles and amphibians but some small mammal species and ground nesting birds also face the risk of fatality from the Proposed Action due to an increase in vehicle traffic from the anticipated construction activities. Indirect impacts to the ecosystem and ecology of the surrounding Project Site could result in an increase in species that will put a strain on food shelter resources.

After construction activities related to the Proposed Action are completed and the Project moves into the construction restoration phase, some impacts to displaced habitat will be reversed when seeding of the Project Site takes place. The Project Site will be reseeded with a short-grass prairie seed mix that will encourage some species to come back to the area if they can access it past the perimeter fence. However, there still may be further impacts to this newly established habitat from periodic maintenance to keep vegetation from impacting solar operations. Normal maintenance and operation activities will cause an increase in human activity which will cause minor impacts to wildlife within the Project Area. The Proposed Action may change the migration pattern for large terrestrial species that cannot pass through perimeter fence. This impact to migration patterns will be relatively minor resulting in most terrestrial species to travel around the Project Site.

A site visit should be conducted for potential burrowing owl (state-listed threatened species) habitat, prior to construction. A survey for burrowing owls would need to be conducted in locations with suitable habitat following CPW's guidance. Active burrowing owl burrows would need to be

and marked and a 150-foot buffer would need to be maintained during ground disturbing activities. Migration patterns near the Project Site will likely change as a result of the Proposed Action.

Federally-listed Threatened and Endangered Species

There is no potential habitat for federally listed species in the Project Site. Additionally, critical habitats would not be impacted.

It is unlikely that direct impacts will occur to aerial species as a result of contacting permanent Project facilities. While it is possible for mortality to occur if birds or bats collide with PV panels or other structures, the likelihood is potential collisions would be minor. This is due to the low height and lack of rapid movement of the panels and other installed structures. The tallest structure will be the top of the lightning protection on the H frame static pole for the Hunter substation; it will be around 50' tall. Accordingly, direct impacts on migratory birds and bats after the installation of facilities from the Proposed Action are anticipated to be minimal.

There are five Platte River species (Least Tern, Piping Plover, Whooping Crane, Pallid Sturgeon, Western Prairie Fringed Orchid) in Nebraska that have the potential to be affected by water-related activities/use in the N. Platte, S. Platte, and Laramie River Basins in Nebraska. The Proposed Action will not involve water-related activities that create depletions; therefore, we have determined that the Project will have no effect on these species. There is no suitable habitat for the remaining three federally listed species (Preble's meadow jumping mouse, Mexican spotted Owl, and Ute Ladies'-tresses); therefore, we have determined that the Project would have no effect on Preble's meadow jumping mouse, Mexican spotted owl, and Ute ladies'-tresses.

The Proposed Action could potentially impact on one of the 11 state listed species, the burrowing owl, (*Anthene cunicularia*) due to historical habitat near the Project Site. A field visit will occur before construction activities take place during Burrowing Owl nesting season, March 15th through October 31st, in order to determine if there will be impacts to burrowing owls within and around the Project Area. The 10 other state-listed species will not be impacted by the Proposed Action. Please see Appendix E for the habitat assessment as CPW consultations.

Migratory Bird Treaty Act

Activities from the Proposed Action will have the potential to impact birds that are protected by the MBTA and BGEPA. In order to construct the solar farm and all other structures associated with the solar complex there is a potential to impact nesting birds and other critical habitat for many grassland species of birds. The construction of the solar complex will permanently impact habitat for many grassland species of birds. A field visit will be performed by a biologist in order to determine that no birds will be impacted from construction activities related to the Proposed Action. If a nesting bird or raptor is found on or within the Project Area during pre-construction

surveys then state and federal laws would be followed for buffers and activity restrictions for the specific species of bird found.

3.6 HISTORIC AND CULTURAL PROPERTIES

3.6.1 Affected Environment – Cultural Resources

Cultural resources include both prehistoric and historic archaeological sites, standing buildings/structures, objects, districts, traditional cultural properties as well as other properties that illustrate long-standing cultural associations with broad patterns of historic events.

Section 106 of the NHPA of 1966, as amended (54 U.S.C. 306108), requires federal agencies take into account effects on historic properties for projects they carry out, assist, fund, permit, license, or approve. The NHPA establishes criteria for both public and private efforts to identify, evaluate, and protect the nation's important historic and archaeological resources. Cultural resources are evaluated for eligibility in the National Register of Historic Places (NRHP), which is maintained by the National Park Service. Resources that are evaluated for inclusion on the NRHP include districts, sites, buildings, structures, and objects that are significant to local, state, or national history and/or prehistory and possess integrity of location, design, setting, materials, workmanship, feeling, and association. Resources that are listed or considered eligible for listing on the NRHP are called "historic properties". To qualify for inclusion on the NRHP, cultural resources must meet at least one of the four primary criteria:

- Criterion A: That are associated with events that have made a significant contribution to the broad patterns of our history; or
- Criterion B: That are associated with the lives of persons significant in our past; or
- Criterion C: That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- Criterion D: That have yielded or may be likely to yield, information important in prehistory or history.

Section 106 of the NHPA requires that Federal agencies consider the possible effects of their undertakings on historic properties. An "undertaking*"* is an activity or program under the direct or indirect jurisdiction of a federal agency that has the potential to affect historic properties. Examples of undertakings may include projects that involve federally-owned land; federal funding, grants, or loans; and federal permitting licensing or approvals. To assess an undertaking's possible effects on historic properties, Section 106 of the NHPA outlines the following four-step process (36 CFR Part 800):

1. Initiating Section 106 - define the undertaking and the APE and identify consulting parties;
2. Identifying Historic Properties - perform studies to evaluate whether cultural resources are present in the APE and if they qualify as historic properties;
3. Assessing Effects - assess whether the undertaking would have effects on historic properties; and
4. Achieving a Resolution - avoid, minimize, or mitigate adverse effects to historic properties.

The RUS is required to consult with the appropriate State Historical Preservation Officer, federally-recognized American Indian tribes that have an interest in the undertaking, and any other party with a vested interest in the undertaking.

The following federally-recognized American Indian tribes were notified of the undertaking on September 1, 2019: the Apache Tribe of Oklahoma; Arapaho Tribe of the Wind River Reservation, Wyoming; Cheyenne and Arapahoe Tribes, Oklahoma; Comanche Nation, Oklahoma; Fort Belknap Indian Community of the Fort Belknap Reservation of Montana; Northern Cheyenne Tribe of the Northern Cheyenne Indian Reservation, Montana; Shoshone-Bannock Tribes of the Fort Hall Reservation.

Hunter Solar conducted a Class III Cultural Resource Survey to identify cultural resources that are listed or potentially eligible for listing on the NRHP. The area of potential effect (APE) for the project consisted of the approximately 571-acre Hunter Solar, LLC Project Site.

In September 2020, letters to each of the above tribes detailed the findings of the Class III Cultural Report and provided an opportunity to comment on the results of the survey. Two of the seven tribes, Arapaho Tribe of the Wind River Reservation, Wyoming and the Shoshone-Bannock Tribes of the Fort Hall Reservation, responded to the letters from RUS. The tribes have requested that in the event any archeological or historical items are found during construction, that RUS contact the tribe(s) so they can perform a survey to determine if construction activities will impact the tribe's cultural resources. As of the date of this report, tribal consultation and Section 106 are complete.

Previous Surveys

Archival research of the Colorado Office of Archaeology and Historic Preservation (OAHP) indicated that there are no previously conducted inventories within one mile of the project. Two sites (5AH120 and 5AH173) were recorded near the Project Site; however, these sites were not associated with past projects, neither is located within the Project Site. There were no known cultural resources within the APE.

Site 5AH120 was identified as a prehistoric bison processing site; cord-marked ceramics suggested a Plains Woodland affiliation, corresponding to the Early Ceramic period. No surface expression of the site was observed, only cultural levels eroding from the cut bank, indicating the high

potential for intact buried cultural levels along Kiowa Creek and its tributaries. 5AH120 is eligible for inclusion in the NRHP.

Site 5AH173 is outside of the project area. The building was built in 1919 and was demolished after 1978, leaving only the brick and concrete foundation. The site is not eligible for inclusion in the NRHP (SWCA 2020).

Methods

Following OAHP guidelines for conducting cultural resource inventories in Colorado, field personnel inspected the project area using a series of parallel, 20-meter (m)-wide transects across the approximately 571-acre project area. Archaeologists examined the ground surface for artifacts, features, and other prehistoric or historic material evidence such as charcoal-stained sediments, as well as aboveground features and structures. To further assess the potential for subsurface archeological deposits in potentially intact soils, special attention was paid to cut banks, field edges, and animal burrows. Surface visibility averaged 50 percent overall. Weather was favorable for the field survey. No artifacts were collected during the course of this inventory In addition, a 10 percent random sample of the low-potential areas of the Project Site would be tested at the more intense 15-meter (50-foot) survey interval.

Survey Results

As a result of the Class III Cultural Resource Inventory, 16 cultural resources were newly recorded. These resources include one segment of one historic county road (5AH3875.1), three prehistoric open lithic scatters (5AH3851, 5AH3853, and 5AH3855), and 12 isolated finds. Per Colorado OAHP guidelines, linear resources that have not been recorded in their entirety and have not had a formal determination of NRHP eligibility are treated as eligible for inclusion in the NRHP for the purposes of the Section 106 review. One linear site crosses the Project and is recommended as needs data: ACR 129 (5AH3875.1). However, this segment was assessed as not meeting any of the criteria for inclusion in the NRHP and did not supporting the overall potential eligibility of the linear resource. SWCA recommended that no further work is required for this segment. Two sites (5AH3853 and 5AH3855) were located where the depositional environments are conducive to the preservation of intact buried cultural levels. The sites were tested to determine if such levels are present, with negative results, and the sites are recommended as not eligible. The remaining site and 12 isolated finds are recommended to be not eligible. No further work is recommended for the not eligible sites and isolated finds.

Table 3.6-1. Summary of Sites recorded during survey and NRHP Recommendations

Site Number	Cultural Affiliation	NRHP Recommendation
Sites		
5AH3851	Prehistoric	Not Eligible
5AH3853	Prehistoric	Not Eligible
5AH3855	Prehistoric	Not Eligible
5AH3875.1	Historic	No Adverse Effect
Isolated Finds		
5AH3856	Prehistoric	Not Eligible
5AH3857	Prehistoric	Not Eligible
5AH3858	Prehistoric	Not Eligible
5AH3859	Prehistoric	Not Eligible
5AH3860	Prehistoric	Not Eligible
5AH3861	Prehistoric	Not Eligible
5AH3862	Prehistoric	Not Eligible
5AH3863	Prehistoric	Not Eligible
5AH3864	Prehistoric	Not Eligible
5AH3865	Prehistoric	Not Eligible
5AH3867	Prehistoric	Not Eligible
5AH3871	Prehistoric	Not Eligible

3.6.2 Environmental Consequences – Historic and Cultural Properties

SWCA evaluated one previously unrecorded historic resource (5AH3875.1). The resource was found as not meeting the criteria for eligibility on the NRHP. Prehistoric resources within the Project APE were considered not eligible for listing on the NRHP. SWCA recommended a finding of "no historic properties affected". On September 24, 2020, the OAHP concurred with a finding of "no historic properties affected". Furthermore, the OAHP stated that "should unidentified archaeological resources be discovered in the course of the project, work must be interrupted until the resources have been evaluated in terms of the National Register eligibility criteria (36 CFR 60.40) in consultation with our office pursuant to 36 CFR 800.13. Also, should the consulted-upon scope of the work change, please contact our office for continued consultation under Section 106 on the NHPA." The letter from the OAHP is located in Appendix F.

The following federally-recognized American Indian tribes were notified of the undertaking on September 4, 2020: the Apache Tribe of Oklahoma; Arapaho Tribe of the Wind River Reservation, Wyoming; Cheyenne and Arapahoe Tribes, Oklahoma; Comanche Nation, Oklahoma; Fort

Belknap Indian Community of the Fort Belknap Reservation of Montana; Northern Cheyenne Tribe of the Northern Cheyenne Indian Reservation, Montana; Shoshone-Bannock Tribes of the Fort Hall Reservation.

On October 15, 2020, Hunter Solar received a notification from the Fort Belknap Tribal Historic Preservation Official to proceed with the project and to contact them if any inadvertent discoveries are uncovered.

On October 18, 2020, the Northern Cheyenne Tribe responded and determined that the project will have 'no effect' and if this project ever deviates from the currently proposed project area their office requests additional consultation.

The Comanche Nation responded on October 20, 2020, stating that they cross-referenced the project with Comanche Nation sites files and 'no properties' have been identified.

As of October 27th, 2020, concurrence has been received from each of the following tribes with the exception of Apache Tribe of Oklahoma; Northern Arapaho, Wyoming; and Cheyenne and Arapaho Tribes, Oklahoma.

On October 28th, 2020, the Northern Arapaho Tribe sent a letter to our applicant, Torch Clean Energy, requesting a site visit to the location, to determine the potential impact to historic properties in the area. The Northern Arapaho participated in a site visit that took place on January 21, 2021. On January 27, 2021, Northern Arapaho submitted their final recommended finding of no adverse effect, in accordance with 36 CFR § 800.5(b), in the direct and visual APE conditioned on "a tribal monitor be on site during all ground disturbing activities (our definition of ground disturbing is any time any amount of dirt is being moved: blading, digging, excavating, trenching, etc.)". In their February 2, 2021, finding letter with conditions, RUS concurred with the Northern Arapaho tribe's request for monitoring and directed Hunter Solar to coordinate with the Northern Arapaho tribe, to fulfill this request.

RUS sent an additional letter to the following non-responsive Tribes on February 18, 2021, requesting a response within 15 business days: Apache Tribe of Oklahoma, the Cheyenne and Arapaho tribes, and the Shoshone-Bannock tribe.

On March 5, 2021, the Shoshone responded with a letter stating that three sites of lithic scatter had been identified near the APE, sites 5AH3851, 5AH3853, and 5AH3855. These sites along with 12 other isolated sites had been identified as not eligible for the National Register. However, the Shoshone-Bannock Heritage Tribal Office requested the avoidance of these three pre-historic open lithic scatters due to their proximity to the proposed project boundary. RUS submitted a response letter dated March 11, 2021, to the Shoshone-Bannock Heritage Tribal Office acknowledging that the three lithic scatter sites 5AH3851, 5AH3853, and 5AH3855 could not be avoided by the solar array design. However, RUS informed the Shoshone-Bannock that a monitor would be on site

during the construction phase to observe the sites during ground-disturbing activities. The letter also included the inadvertent discovery plan for the Hunter Solar Facility. On March 22nd, RUS submitted a follow-up letter to the Shoshone-Bannock Heritage Tribal Office, and as of the date of this letter, RUS has not received a follow-up response from the Shoshone-Bannock Tribe.

As of the date of this report, consultation with American Indian tribes is complete and RUS has concluded that Section 106 is complete.

In the event that unanticipated discoveries of human remains or cultural resources should occur during construction or operations, these activities would cease immediately. Coordination would be required between Hunter Solar, LLC, RUS, the OAHP, and the tribes before further action is taken.

3.7 AESTHETICS

3.7.1 Affected Environment – Visual Resources

Background

Visual resources include both natural and man-made attributes and embody the visual characteristics of a place. These resources can influence how an observer experiences a particular location. Viewer groups can include local residents, people traveling on E Quincy Ave and County Road 129, and people who work in the area. A viewshed describes the environmental context and visual character that can be seen from a certain vantage point.

Methodology

Key Observation Point Identification

Key Observation Points (KOP) were identified in areas where the project might be visible to viewer groups in the vicinity of the Project Site. These locations were chosen along E Quincy Ave and County Road 129, where travelers are anticipated. A map of each KOP location, showing an aerial photo, is included below.

Photo Simulation

For each KOP, photo simulations were created based off existing photos as well as a three-dimensional model of the proposed solar panels and layout.

Existing Conditions

The visual setting is currently comprised of undeveloped agricultural land. Elevation on the Proposed Project and ranges from 5,710 to 5,800 feet above sea level; surrounding properties range from 5,650 to 5,850 feet above sea level (USGS 2016). Based on the topographic maps and site

reconnaissance, the Proposed Project has a general topographic gradient to the east towards Kiowa Creek. Kiowa Creek is located approximately 0.36 miles to the east of the project boundary. Surrounding properties largely consist of undeveloped agricultural land and rural residential development with a commercial warehouse located at 4405 S County Road 129, Bennet, CO 80136, which is owned by the Arapahoe County. The warehouse is located near the northwest section of the Project Site. An IREA substation is located toward the south of the Project Site. Anticipated viewer groups include nearby residents and travelers on E Quincy Ave and N County Road 129.

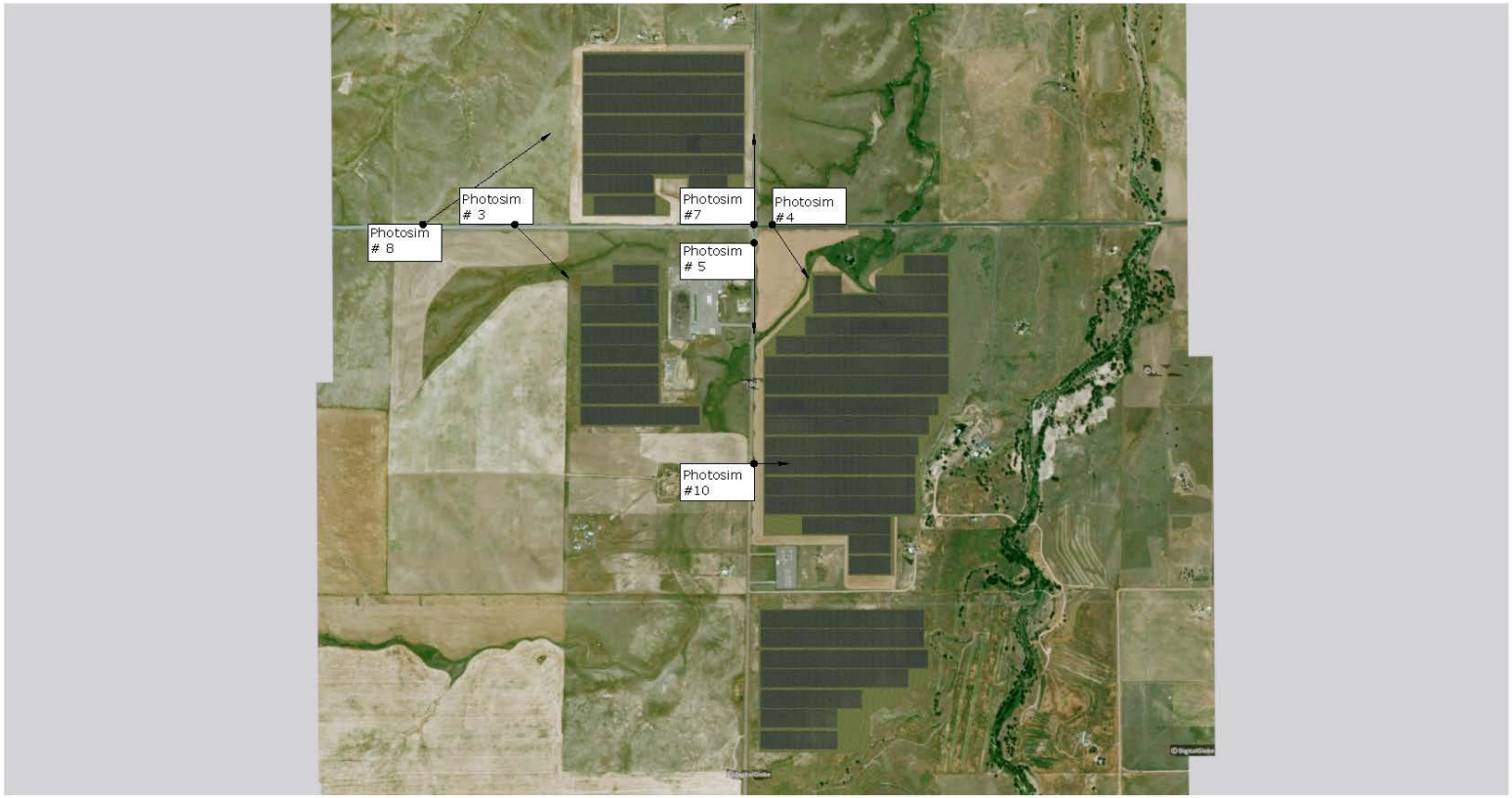


Figure 3.8-1. Photo Locations of the Proposed Project Site

The Project Site is mostly agricultural land with actively farmed areas present. The viewshed is comprised of an agricultural setting with industrial development (including an electric substation and warehouse), in addition to residential dwellings and farmsteads. Both paved and dirt roads are adjacent to the Project Site. The electric substation is visible from locations throughout the Project Site (Photo 3.8-1).

Photo 3.8-1. A representative view of the Project Site

3.7.2 Environmental Consequences – Visual Resources

The Project Site would be setback 100 feet from front and side property lines and 50 feet from rear property lines; it will be surrounded by an approximately eight foot tall chain link security fence where visible from the public right-of-way.

Due to increased traffic and movement of heavy machinery throughout the Site and along local roads, indirect impacts to visual resources around the Project Site may occur. These impacts are anticipated to be minor as well as both temporary direct and indirect impacts.

During the operation phase of the Proposed Action, minor visual impacts would continue to occur. The Project Site will be managed to be a low-growth ecosystem with natural seed mix. Photo 3.8-2 shows typical solar panel arrays.

Photo 3.8-2. Single-axis, tracking photovoltaic system with panels close to maximum tilt

Visually, the scenery with PV panels would be different from the current scenery on the proposed Project Site. Photos were taken along Quincy Avenue and County Road 129 in the vicinity of residential homes. In this case, KOPs were located along public roads in the vicinity of residential homes from which the Project Site may be visible. Figure 3.8-1 shows the visual rendering baseline photo KOP locations.

The visual simulations for the photo locations show the baseline photos and the renderings of the likely appearance of the PV panels from these photo locations.

Visual Simulation 1 shows the view from KOP 3 facing towards the southeast. The low panel height makes the panels visually unobtrusive and are congruous with the relatively flat topography. While travelers on Quincy are anticipated, impacts from visual location 1 are anticipated to be minor.

Existing

Proposed

Visual Simulation 1: View from KOP 3 Looking Southeast from Quincy

Visual Simulation 2 shows the view from KOP 4 looking southeast toward Quincy and Brickcenter Road. As with simulation 1, the low height of the panels makes them visually unobtrusive. The transmission lines remain a dominant feature in this viewshed. While travelers on Quincy are anticipated, impacts at visual location 2 are anticipated to be minor.

Existing

Proposed

Visual Simulation 2: KOP 4 Looking SE at Quincy and Brickcenter

Visual Simulation 3 shows the view from KOP 5 facing southeast. The low profile of the panels makes them relatively unobtrusive. Transmission lines remain a dominant feature in this viewshed. This view also shows an existing substation in the distance (bottom right hand corner). Fewer people travel County Road 129 than Quincy Avenue. Visual impacts at location 3 are anticipated to be minor.

Existing

Proposed

Visual Simulation 3: View from KOP 5 Looking Southeast at Brickcenter From South of Quincy

Visual Simulation 4 shows the view from KOP 10 facing east. The panels are visible at this viewer location, which is in close proximity to the Proposed Action. Transmission lines remain a dominant feature in this viewshed. Fewer people travel County Road 129 than Quincy Avenue. Visual impacts at location 3 are anticipated to be minor due to a buffer between the project boundary and the road.

Existing

Proposed

Visual Simulation 4: View from KOP 10 Facing East

While there will be a change in agricultural to industrial use, visual impacts from the Proposed Action are anticipated to be minor due to the low population density in the vicinity of the Proposed Action, evidence of existing industrial facilities (including the substation) within the viewshed, and screening by a privacy fence.

The construction stage of the Proposed Action will result in temporary impacts. It is anticipated that vegetation would be removed as a result of construction. Dust will be controlled with dust suppression measures such as truck-mounted water sprayers during the hours of construction activities. Travelers on nearby roads are expected to make up the majority of viewers. Nearby residents would make up another viewer group. As the area consists of low-density residential, visual impacts during construction would be minor.

It is anticipated that impacts of decommissioning would be similar to construction. Minor impacts are anticipated from decommissioning activities. The land use could be returned to agriculture once the panels are removed.

3.8 AIR QUALITY

3.8.1 Affected Environment – Air Quality

Air Quality Standards

The Clean Air Act (CAA) of 1970 and its subsequent amendments led to the development of National Ambient Air Quality Standards (NAAQS) for several criteria air pollutants: nitrogen dioxide (NO2), carbon monoxide (CO), ozone (O3) from volatile organic compound (VOC) precursors, particulate matter (PM10 and PM2.5), sulfur dioxide SO2), and lead (Pb). Under the CAA, cities, counties, or regions were required to determine their compliance with the NAAQS. Areas that did meet NAAQS were classified as attainment areas and those which could not were classified as non-attainment areas. An area can be designated as a maintenance area if it was classified as non-attainment but later was re-designated to attainment. Table 3.8-1 below lists the NAAQS criteria air pollutant standards.

Table 3.8-1. NAAQS Criteria Air Pollutant Standards

Pollutant	Primary/ Secondary	Averaging Time	Level	Form	Attainment or Non-attainment
Carbon Monoxide (CO)	primary	8 hours	9 ppm	Not to be exceeded more than once per year	Maintenance area
		1 hour	35 ppm		
Lead (Pb)	primary and secondary	Rolling 3-month average	0.15 μg/m3	Not to be exceeded	Attainment
Nitrogen Dioxide (NO2)	primary	1 hour	100 ppb	98th percentile of 1- hour daily maximum concentrations, averaged over 3 years	Attainment
	primary and secondary	1 year	53 ppb	Annual Mean	
Ozone (O3)	primary and secondary	8 hours	0.070 ppm	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years	Non-attainment

Pollutant		Primary/ Secondary	Averaging Time	Level	Form	Attainment or Non-attainment
Particle Pollution (PM)	PM2.5	primary	1 year	12.0 µg/m3	Annual mean, averaged over 3 years	Attainment
		secondary	1 year	15.0 µg/m3	Annual mean, averaged over 3 years	
		primary and secondary	24 hours	35 µg/m3	98th percentile, averaged over 3 years	
	PM10	primary and secondary	24 hours	150 µg/m3	Not to be exceeded more than once per year on average over 3 years	Maintenance area
Sulfur Dioxide (SO2)		primary	1 hour	75 ppb	99th percentile of 1- hour daily maximum concentrations, averaged over 3 years	Attainment
		secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year	
Carbon Monoxide (CO)		primary	8 hours	9 ppm	Not to be exceeded more than once per year	Maintenance area
			1 hour	35 ppm		
Lead (Pb)		primary and secondary	Rolling 3-month	0.15 µg/m3	Not to be exceeded	Attainment
Nitrogen Dioxide (NO2)		primary	1 hour	100 ppb	98th percentile of 1- hour daily maximum concentrations, averaged over 3 years	Attainment

Pollutant		Primary/ Secondary	Averaging Time	Level	Form	Attainment or Non-attainment
		primary and secondary	1 year	53 ppb	Annual Mean	
Ozone (O3)		primary and secondary	8 hours	0.070 ppm	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years	Non-attainment
Particle Pollution (PM)	PM2.5	primary	1 year	12.0 µg/m3	Annual mean, averaged over 3 years	Attainment
		secondary	1 year	15.0 µg/m3	Annual mean, averaged over 3 years	
		primary and secondary	24 hours	35 µg/m3	98th percentile, averaged over 3 years	
	PM10	primary and secondary	24 hours	150 µg/m3	Not to be exceeded more than once per year on average over 3 years	Maintenance area
Sulfur Dioxide (SO2)		primary	1 hour	75 ppb	99th percentile of 1- hour daily maximum concentrations, averaged over 3 years	Attainment
		secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year	

Regional Air Quality

The project location in Arapahoe County is in attainment with the NAAQS for NO_2, $PM_{2.5}$, SO_2, and Pb. The Proposed Project location is considered non-attainment for the 8-hour O3 standard and a maintenance area for the CO, PM_{10} and the 1-hour O3 standard according to the EPA's current Green Book and the CDPHE (Green Book | US EPA 2020). Below is a table showing the 12-hour variance in O_3 from the nearest ambient air monitoring station for Wednesday July 7, 2020.

Table 3.8-2 Aurora East Monitoring Station Ozone Data for 07/07/2020

*Hour (MST)	O_3 PPB	RD deg	RS mph	TEMP deg F	WD deg	WS mph
1:00 AM	50	195.9	21.0	69	196	21
2:00 AM	45	206.5	18.0	67	206	18
3:00 AM	41	211.0	14.0	65	211	14
4:00 AM	39	219.3	13.0	64	219	13
5:00 AM	39	201.9	14.0	65	201	14
6:00 AM	39	200.7	17.0	69	200	17
7:00 AM	42	202.8	18.0	78	202	18
8:00 AM	44	195.9	18.0	83	195	18
9:00 AM	46	200.3	15.0	85	200	15
10:00 AM	47	195.4	13.0	87	195	14
11:00 AM	48	209.9	11.0	90	211	12
12:00 PM	47	198.0	8.0	91	202	10
1:00 PM	47	170.2	11.0	86	168	16

Mountain Standard Time (MST); Ozone (O_3); Parts Per Billion (PPB);Vector Wind Direction (RD); Degrees (deg); Vector Wind Speed (RS); Miles Per Hour (mph); Temperature (TEMP); Fahrenheit (F); Scalar Wind Direction (WD); Scalar Wind Speed (WS).

Regional Climate

The potential for the atmosphere to disperse emissions of air pollutants is influenced by weather conditions. Regional climate in the local land resource area (MLRA 67B) of the Project Site is characterized by average annual precipitation of 12 to 18 inches (305 to 455 millimeters). Precipitation generally increases from west to east within the land resource area. This rainfall occurs as frontal storms in spring and early summer; in the late summer high-intensity convective thunderstorms are common. Maximum precipitation occurs from the middle of spring through late autumn. In winter, precipitation occurs as snowfall. The average annual temperature is 45 to 55 degrees Fahrenheit (7 to 13 degrees Celsius). On average, the freeze-free period is 160 days but ranges from 135 to 190 days (USDA 2006).

Greenhouse Gas Emissions

Greenhouse gases are compounds that trap and convert sunlight into infrared heat; they are found naturally within the earth's atmosphere. In this way, GHGs act as insulation in the stratosphere and contribute to the maintenance of global temperatures. Temperatures increase on earth as a result of GHGs increase at ground level. This is commonly known as global warming, which is associated with climate change. Negative economic and social consequences are anticipated as a result of changes in weather (e.g., more intense hurricanes, greater risk of forest fires, flooding).

Carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) are the most common GHGs emitted from natural processes and human activities. In the US, the primary GHG emitted as a result of human activities is CO_2, which represents approximately 85 percent of total GHG emissions. Fossil fuel combustion accounts for the he largest source of CO_2 and of overall GHG emissions. CH_4 emissions, which mostly result from enteric fermentation (digestion) associated with domestic livestock, decomposition of wastes in landfills, and natural gas systems, have declined from 1990 levels. N_2O emissions in the US primarily result from agricultural soil management and mobile source fuel combustion.(EPA 2019b).

3.8.2 Environmental Consequences – Air Quality

The impacts to air quality from the Projectwould be minimal and temporary due to exhaust emissions from construction equipment used to install array panel support structures. Minimal dust will be temporarily generated during the solar array construction which is anticipated to last for nine to 12 months. Dust would be controlled with dust suppression measures such as truck-mounted water sprayers during the hours of construction activities. Water would be provided by the water truck contractor based on their water permits; water would not be gathered for dust control from the site.

During construction of the Project, vehicles would enter and exit the site five days per week using an estimated 25 to 75 personal vehicles and two to 20 delivery trucks per day. Ongoing activities at the project location would only generate fugitive particulate emissions that result from less than one mile of travel on existing roads and gravel access roads for each site visit that is made after the installation of the solar array is complete. After the completion of the installation, normal operations are anticipated to require no more than one to three vehicles per day Monday through Friday, and one Saturday and Sunday to visit the project site. Under the worst-case operational conditions, vehicle emissions are anticipated to be temporary and minimal. Once the Facility is constructed, it will not create emissions and would reduce the emissions from the processing and combustion of fossil-fuels at other locations. Vehicle emissions associated with visits to maintain the Facility are not expected to contribute significantly to increased carbon emissions or other greenhouse gases. The Project does not meet the exemption from CDPHE's Air Quality Division review, and a Land Development Air Pollutant Emissions Notice (APEN [Form APCD-223]) will be required prior to construction. An APEN would be processed for the Proposed Action.

3.9 SOCIO-ECONOMIC IMPACT ASSESSMENT/ENVIRONMENTAL JUSTICE

3.9.1 Affected Environment – Socioeconomics/Environmental Justice

Socieconomics

The following socioeconomic patterns were analyzed for the Project Site: population trends, racial and ethnic statistics, economic indicators, and employment data. Data was analyzed at the block group, county, state, and US levels for the purpose of comparison.

The proposed Project Site is in Arapahoe County, Colorado, approximately 8.5 miles south of the Town of Bennett in Arapahoe County or approximately 19 miles north of the town of Kiowa in Elbert County, Colorado. The Project Site is located within US Census Bureau (USCB) Block Group 1, Census Tract 71.06.

Population

Statistics for the current population as well as projections for Arapahoe County are presented in Table 3.13-1. In 2019, Arapahoe County's population was estimated to be 656,590 (based off the 2010 census). The block group (Block Group 1, Census Tract 71.06) where the Project Site is located, has an estimated population of 2,021. Between 2000 and 2019, Arapahoe County's population increased by 14.8 percent. The population in the State of Colorado by 14.5 percent while the population of the US grew by 6.3 percent during the same period (USCB 2000; USCB 2010; USCB 2019). Between 2019 and 2025, the County's population is projected to increase to 701,091 (6.3 percent), while the population in Colorado is projected to increase by 8 percent (DOLA2020b).

Table 3.9-1. 2000 – 2025 Population Data

Area	2000	2010	2019	Projection 2025	Change 2000 - 2019	Change 2019 - 2025
Project Area Block Group	N/A	1654	2021	N/A	N/A	N/A
Arapahoe County	491,641	572,003	656,590	701,091	25.1%	6.3%
Colorado	4,301,261	5,029,196	5,758,736	6,252,913	25.3%	8%
United States	281,421,906	308,745,538	328,239,523	NA	14.3%	NA

Sources: USCB 2000, USCB 2010; USCB 2019; DOLA 2020b;

Employment and Income

Table 3.13-2 shows employment trends for Arapahoe County, Colorado, and the United States. The total employment in Arapahoe County was 470,631 jobs in 2018. Approximately 0.18 percent are employed in farming. This is less than the state level of 1.2 percent and the national level of 1.3 percent. Manufacturing provides 2 percent of the jobs in Arapahoe County, which is less than the state level of 4.3% and the national level of 6.8 percent. Retail trade in Arapahoe County (8.8 percent) is very slightly higher than in the state (8.6 percent). Both figures for retail trade are lower than the national level of 9.8 percent. Government employment in Arapahoe County is 8.8 percent, which is less than both the State level of 12.9 percent and the National level of 12.4 percent (Bureau of Economic Analysis [BEA] 2017a).

The average unemployment rate for Arapahoe County by July 2019 was 2.7 percent, which is lower than the state rate (2.8 percent) and the national rate (3.7 percent) (Bureau of Labor Statistics 2019).

Table 3.9-2. 2018 Employment Data

Area	Total Employment	Percent Farm	Percent Manufacturing	Percent Retail Trade	Percent Government
Arapahoe County	470,631	0.18%	2%	8.8%	8.8%
Colorado	3,949,744	1.2%	4.3%	8.6%	12.9%
United States	137,434,000	1.3%	6.8%	9.8%	12.4%

Source: BEA 2018

Table 3.13-3 presents per capita personal income for the County, State and the United States. Per capita personal income in Arapahoe County in 2018 was $60,180 (110.5% percent of the national average) of $54,446. The per capita income in Arapahoe County is also higher than the state average of $58,456 (BEA 2019b).

Table 3.9-3. 2017 Per Capita Personal Income Data

Area	Per Capita Personal Income (Dollars)	Percent of US
Arapahoe County	60,180	110.5%
Colorado	58,456	107.3%
United States	54,446	100.0%

Source: BEA 2019a

Environmental Justice

EO 12898, entitled "Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations" directs federal agencies to identify and address, as appropriate, potential disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. An adverse effect that is predominately borne or suffered by a minority population and/or a low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority population and/or non-low-income population is defined as a disproportionately high and adverse effect. In addition to the EO, a Presidential Memorandum accompanying the directs agencies to incorporate environmental justice concerns in their NEPA processes and practices. *Environmental Justice: Guidance under the National Environmental Policy Act* (CEQ 1997) provides guidance for addressing environmental justice. The following definitions were used to define minority populations and low-income populations:

- *Minority individuals.* Individuals who identify themselves as members of the following population groups: American Indian or Alaskan Native, Asian, Native Hawaiian or Other Pacific Islander, Black, Hispanic, or two or more races.
- *Minority populations.* Minority populations are identified where (1) the minority population of an affected area exceeds 50 percent or (2) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. For the purposes of this analysis, "meaningfully greater" is defined as greater than 20 percent of the minority population percentage in the general population of the larger geographical region within which the affected area is located.
- *Low-income populations.* Low-income populations in an affected area are identified with the annual statistical poverty thresholds from the USCB Current

Population Reports, Series P-60, on Income and Poverty. In this analysis, low-income populations are identified where (1) the population of an affected area exceeds 50 percent low-income based on the Census data or (2) the percentage of low-income population in the affected area is greater than 20 percent of the low-income population percentage in the larger geographical region within which the affected area is located.

Data from the USCB is used to assess minority and low-income populations within an affected area of a project. For the Project, minority populations are identified by assessing the racial and ethnic statistics of the community in comparison to the general population of Arapahoe County. If a community has a minority population greater than fifty percent or that is meaningfully greater than the general population of Arapahoe County, it is identified as having a minority population. A census block group is the geographic unit used to identify environmental justice communities of concern. If one of the two criteria described above for either minority or low-income populations are met, a census block group would be considered an environmental justice community. As the Project Site falls within Arapahoe County, it is the geographical impact area for environmental justice.

Minority Population

CEQ guidance used for the analysis of minority populations in the vicinity of the Project Site. Information was derived from the 2013 to 2017 American Community Survey 5-Year Estimates (USCB 2018).

Table 3.9-4 presents the results of the minority population analysis for the area of interest. The Project Area Block Group has 32 percent minority population, which is less than Arapahoe County, (39 percent). Therefore the residents of the Project Area Block Group are not considered an environmental justice community because the minority population does not exceed 50 percent of the total population nor does it represent 20 percent or more greater minority population than Arapahoe County (EPA 2020c).

Table 3.9-4. Estimated Minority Population Data

Area	Total Population	Minority Population	Percent Minority Population
Project Area Block Group	2,021	654	32
Arapahoe County	626,612	242,417	39

Source: EPA 2019

Low-income Populations

CEQ guidance was utilized to identify low-income populations in the Project Site. The 2014-2018 American Community Survey 5-Year Estimates were assessed for the Project Area Block Group, Arapahoe County, Colorado and the United States.

The low-income population is presented in Table 3.14-2; the table compares populations for the Block Group, Arapahoe County, Colorado and the US. In 2019, the portion of the population in Arapahoe County that had income below the poverty level was 6.9 percent (USCB 2018). These levels are below the state average of 9.3 percent (USCB 2018). Based on this analysis, residents within a mile of the Project Site are not considered an environmental justice community because the low-income population within a mile of the Project Site does not exceed 50 percent of the total population nor 20 percent greater than the comparable county low-income population.

Table 3.9-5. 2019 Estimated Poverty Level Data

Area	Total Population	Persons Below Poverty Level	Percent of Persons Below Poverty Level
Project Area Block Group	2,000	44	2.2%
Arapahoe County	648,857	44,815	6.9%
Colorado	5,637,904	526,979	9.3%
United States	320,118,791	39,490,096	12.3%

Source: USCB 2019

3.9.2 Environmental Consequences

This section describes potential impacts to socioeconomic and environmental justice resources should the No Action or Proposed Action alternative be implemented. Social and economic issues considered for evaluation within the impact area include change to current and projected population levels, change in expenditures for goods and services, and short-term or long-term impacts on employment and income. Environmental justice impacts address disproportionately high adverse human health or environmental effects. These impacts occur when the risk or rate of exposure to a minority or low-income population resulting from natural or physical environment is high and appreciably exceeds the impact level for the general population or for another appropriate comparison group (CEQ 1997).

Socioeconomics

A variety of operation and maintenance related activities are anticipated as a result of implementing the Proposed Action. These activities would directly affect employment, industry, and commerce in surrounding areas. Short-term, beneficial, direct impacts are anticipated for the local economy as a result of construction activities. Economic stimulation may also result in positive indirect impacts to the general area.

Benefits of this alternative include decreasing the demand for and use of fossil fuel-based energy for residents and businesses located in Arapahoe County. Another benefit will be direct energy cost savings to participating IREA customers (i.e., residential, commercial, and municipal clients). Thus, the communities within the IREA service territory will enjoy an increase in the long-term sustainability of their energy use. This alternative would also provide beneficial economic impacts by increasing temporary and permanent jobs as well as a tax base for Arapahoe County. It is anticipated that 167.78 temporary local construction jobs, 985.68 total temporary construction jobs, and 10.49 permanent jobs will be created as a result of the Preferred alternative.

Significant impacts are not anticipated for the conversion of farmland as a result of the of the Proposed Action. The solar facility would be located on land that would be leased from the current landowners; therefore, these individual landowners would benefit directly from the Proposed Action. Approximately 282,912 acres of land in Arapahoe County is dedicated to farming (as described in Table 3.2-1). The approximately 571 Project Site comprises approximately 0.2 percent of the total farmed land in the County. As such, the reduction in farmland would not constitute a significant change to the local economy.

Local employment would occur in the construction trades as a result of the Proposed Action. These impacts are anticipated to temporary. It is anticipated that 167.78 temporary local construction jobs, 985.68 total temporary construction jobs, and 10.49 permanent jobs will be created as a result of the Preferred alternative. A maximum of 250 people could be working during the peak construction period of the facility. Hunter Solar will strive to fill as many local jobs as possible.

Benefits associated with construction of the Proposed Action include the local or regional purchase of construction materials, equipment, and services in the area as well as a temporary increase in employment and income from hiring a construction force.

Operation of the Project would have a small positive impact on employment in Arapahoe County. One to three employees would visit the Project Site as needed for scheduled/preventative maintenance and for unscheduled maintenances or outages. The site would be monitored from an offsite facility staffed by a permanent workforce. A temporary workforce of 12 employees would be possibly once every two years for approximately 30 days for solar panel cleaning activities. Grounds maintenance and other specific contracts for Project operation would most likely be local and ongoing on a regular basis. The Project would not provide significant local employment opportunities. There would not be a significant increase in the number of permanent residents in the community.

Long-term, positive socioeconomic impacts are anticipated during the operation of the Proposed Action. The local tax base would increase from construction of the solar facility and would be most beneficial to the Arapahoe County area. Additionally, services such as water and sewer, which are typically associated with a large capital investment, would not have to be provided by the local government.

Environmental Justice

Minority and low income persons will not be disproportionately affected compared to the rest of the population by the Proposed Action. Furthermore, based on the analysis for all resource areas presented in this EA, it was determined that there would be no significant adverse human health or safety impacts or significant adverse environmental impacts. As no minority or low-income populations were identified within connection to the Project Site, there would be no disproportionately high or adverse direct or indirect impacts on minority or low-income populations due to human health or environmental effects resulting from the Proposed Action.

3.10 NOISE

3.10.1 Affected Environment

The Project Area is surrounded by agricultural and undeveloped land with some rural residential and commercial buildings in the area. The nearest community is Bennett, Colorado which is 8.5 miles to the north. Since the Project Site is located in a rural area with minimal human traffic and activity, noise levels are relatively low. Most noise around the Project Area comes from vehicles traveling along Quincy Avenue and County Road 129. Noise levels are generally higher during peak travel times during the day with a decrease during the evening and night.

Noise is defined as unwanted or unwelcome sound. Noise, which is typically caused by human activity, includes sound that disrupts normal activities and diminishes the quality of the environment. The following considerations influence the community response to noise: the intensity of the sound source, its duration, the proximity of noise-sensitive land uses, and the time of day the noise occurs (i.e., higher sensitivities would be expected during the quieter overnight periods). Various units including decibel (dB), A-weighted decibel scale (dBA), sound level equivalents (L_{eq}), day-night average sound levels (L_{dn}), and percentile are used to measure noise levels.

The decibel is the most common unit of sound, and the dB scale is an unweighted logarithmic unit of measure based on sound pressure or intensity. The dBA scale is based on intensity and weighted for frequency. The human ear does not perceive all frequencies in the same way, as dBA increases, hearing is more likely to be damaged. The dBA is the most common measurement of sound and environmental noise; it is a logarithmic scale that ranges from 0 dBA to about 140 dBA and approximates the range of human hearing (Quora 2019). The approximate noise levels of common activities/events measured in dBA are provided below.

- 0 dBA - the softest sound a person can hear with normal hearing
- 10 dBA - normal breathing
- 20 dBA - whispering at 5 feet
- 30 dBA - soft whisper
- 50 dBA - rainfall
- 60 dBA - normal conversation
- 110 dBA - shouting in ear

- 120 dBA - thunder

Noise levels are computed over a 24-hour period. Noise level measurements between the hours of 10 pm and 7 am are artificially increased by 10 dB to adjust for nighttime annoyances. Day-night sound level units are typically measured in L_{dn}. In the US, the L_{dn} has adopted by most Federal agencies as it is recommended by the EPA. The EPA has identified an L_{dn} of 55 dBA as being the level below which there is no adverse impact. An L_{dn} of 65 dBA represents a compromise between community impact and the need for construction. As such, it is commonly used for noise planning purposes (EPA 1974).

Noise Regulations

The following Federal laws and guidelines consider potential sound and vibration issues:

- NEPA;
- Noise Control Act;
- Federal Energy Regulatory Commission Guidelines; and
- Occupational Safety and Health Administration (OSHA) standards for worker occupational noise exposure.

OSHA's occupational noise exposure standard states that when sound levels exceed 90 dBA over an 8-hour exposure period, protection against the effects of noise exposure must be provided for employees when sound levels exceed 90 dBA over an 8-hour exposure period. These must consist of feasible administrative or engineering controls. Personal protective equipment must be provided and used to reduce exposure if the implemented controls do not reduce sound noise to acceptable levels. An employer would be required to implement a hearing conservation program if employee noise exposure were equal to or in excess of 85 dBA, which is the action level of an 8-hour time-weighted average sound level. This program has the following objectives: to prevent initial occupational hearing loss, preserve and protect remaining hearing, and equip workers with training and hearing protection devices. Periodic area and personal noise monitoring, performance and evaluation of audiograms, provision of hearing protection, annual employee training, and record keeping would be required under the hearing conservation program (OSHA 2002.)

The EPA and the U.S. Department of Housing and Urban Development (HUD) Noise Guidebook both provide guidance on community noise. The EPA guidance contains criteria for sound levels affecting residential land use: an L_{dn} less than 55 dBA for exterior levels and an L_{dn} less than 45 dBA for interior levels (EPA 1974). The HUD Noise Guidebook recommends that exterior areas of frequent human use follow the EPA guideline of 55 dBA L_{dn} (HUD 2009). Therefore 55 dBA L_{dn} is considered the threshold for determining potential sound level impacts at sound-sensitive receivers like residences in the absence of a quantified sound level threshold from local regulations,

The Noise Control Act of 1972, as amended, directs State and local government agencies to comply with Federal, State, and local noise requirements. This act delegates authority to the states to regulate environmental noise, and directs (US General Services Administration 1972).

Background Noise Levels

In general, the largest contributors of noise levels are major transportation corridors, railways, airports, industrial facilities, and construction activities. In rural areas typical background day/night noise levels range between 35 and 50 dB while noise levels range from 43 dB to 72 dB in higher-density residential and urban areas (EPA 1974). Background noise levels greater than 65 dBA can interfere with normal conversation, watching television, using a telephone, listening to the radio, and sleeping.

Sources of Noise

Sources of noise both in the vicinity of, and on, the Project Site that are typical of a rural agricultural community. These sources include the following: vehicular traffic from local roadways and agricultural operations.

Both Quincy Avenue and County Road 129 are primary sources of traffic noise for the Project Site. Factors such as traffic volume, traffic speed, and vehicle type can influence noise generation. For people who live more than 500 feet from heavily traveled freeways or more than 100 to 200 feet from lightly traveled roads, traffic noise is not usually a serious problem (Federal Highway Administration 2011).

3.10.2 Environmental Consequences

Temporary noise levels may increase during the nine to 12-month construction period of the Proposed Project. Noise measurements were not taken; rather, estimated based on the vehicle data provided by the Applicant.

The Colorado Department of Transportation (CDOT) Noise Abatement Criteria (NAC) were used to calculate noise levels of the Proposed Project. Given the estimated number of no more than 25 to 75 vehicles per day traveling an average of 30 miles per hour ("mph"), entering/exiting the Project Area twice a day, for nine to 12 months, noise levels are anticipated to temporarily rise above 86 dB during the construction of the Proposed Action. During the Proposed Project's construction phase, the loudest-hour (the one [1]-hour period where the worst-case noise levels are expected to occur) noise level is anticipated to meet or exceed the 66 dB residential NAC. For construction related concerns, please contact (310) 881-3087. Because there are residences located adjacent to the Proposed Project, construction vehicle speed will be limited to 30 mph on Quincy Avenue during construction to minimize project-related noise. Additionally, the following mitigation measures are recommended during the construction phase of the Proposed Project:

- Restricting speed to less than 10 mph in the work zone;

- Limiting truck routes;
- Buffering zones between the truck routes and residential areas (see Exhibit A of the 1041 Application Narrative); and
- Laying gravel for access.

Impacts from implementation of the Proposed Action are anticipated to be minor, and temporary for residents living in proximity to the Project Site. These impacts to the ambient noise environment will be during construction. Once construction is completed, minor permanent impacts to noise would result from inverters and the substation transformer. Noise from the inverters are anticipated to be approximately 58 dB; however there will be no noise after the sun is down or at distances of more than 150 feet from the inverters.

3.11 TRANSPORTATION

3.11.1 Affected Environment

Roads

The Proposed Action is Arapahoe County, Colorado and approximately 20 miles east of Denver, Colorado and approximately 8 miles south of Bennett, Colorado. Land use around the Project Site is mostly agricultural and short grass prairies. The primary access road to the Project Area is east Quincy Avenue, and an ancillary road, County Road 129, allows access to facilities, businesses, and agricultural fields around the Project Site. Access for construction traffic to the area surrounding the Project Site from outside the rural area would occur from I-70 or E-470.

Traffic

There is only a small amount of local traffic. as the Project Site is located in rural Arapahoe County, Colorado. The Colorado Department of Transportation (CDOT) measures the Annual Average Daily Traffic (AADT) data throughout the state of Colorado. There is minimal AADT data for the Project Area and the nearest data in the area is in the town of Bennett, Colorado which is approximately 8 miles to the north. This station (station number 106692) is located on 1st street and has a AADT of 6,000 from 2018 (CDOT 2020).Given the rural location of the Project Site. It is anticipated that the AADT would be less then Bennett, Colorado

3.11.2 Environmental Consequences

Impact to roads in the immediate vicinity, which are currently used by local workers, farmers, residents, and visitors would result from construction of the Project. A typical day will include the transportation of workers, movement of heavy equipment, and transportation of materials during the peak of construction. An increase of road traffic would result from construction-related movement of people, materials and equipment; this increase would vary depending on the phase of construction.

Construction of the Project would employ up to 250 workers per day during the peak construction period. A majority of these workers would likely commute from the local or regional area. Other workers would come from outside the region and many would likely stay in local hotels. The anticipated number of vehicles to visit the full 75 MWac Project during construction will be no more than 25 to 75 personal vehicles and two to 20 delivery trucks per day. Upon completion of the Project installation, no more than one to three vehicles per day Monday through Friday and one Saturday and Sunday are anticipated to visit the site. A temporary rise in vehicle traffic during the nine to 12-month construction period for the full 75 MWac Project is anticipated. However, given the limited number of vehicles visiting the site over the9- to 12-month construction period, traffic patterns are not anticipated to be impacted. If construction traffic is expected during school bus hours, it is recommended that the construction crew contact the school district to minimize traffic conflicts.

Typical transport shipping and container trucks will be used to transport equipment to the site. Typical shipping containers are 40 feet in length and shipping trucks can vary between 45 to 53 feet in length. None of the transport vehicles should exceed 45,000 pounds in cargo weight and typically hold between 34,000 to 44,000 pounds of cargo. The tare weight (unloaded weight) of a shipping vehicle or container is typically around 15,000 pounds without any contents and not including the weight of the truck. Transport deliveries of the solar equipment will account for about a third of the daily trips, or eight to nine vehicles per day. All transport vehicles will comply with the CDOT Maximum Legal Dimensions and Weights on State, Federal, and Local Routes.

Transportation impacts of public roads such as unreasonable congestion or unsafe conditions would not be caused as a result the Project. The Project components, including the solar modules, mounting system, inverters, transformers, electrical cabling, and ancillary construction equipment would be transported to the site using standard trucking methods as described above during construction. Hunter Solar, LLC will coordinate with Arapahoe County, as appropriate, to assure construction traffic does not place any undue burdens on the community. Additionally, the Project does not include the installation of public roadways or additional transportation infrastructure.

Additionally, trips of the delivery trucks would be staggered over time in order to keep traffic light and avoid congestion. The solar modules, mounting system, electrical cabling, and inverters are all of appropriate size, shape, and weight to be transported to the site on County Road 30 (Quincy Ave) and County Road 129, and other state or local roads using shipping vehicles as described. It is not anticipated that oversize/overweight loads will be needed.

Once construction is complete, there would be no long-term traffic impacts from the Project.

One or two employees would visit the Project Site as needed for scheduled/preventative maintenance and for unscheduled maintenances or outages during operation of the solar facility. A once per year washing of the solar panels would increase this number by 12 employees, and water trucks would be present on-site temporarily for approximately 30 days. Significant impacts on local roadways are not anticipated due to the increased traffic.

Overall, direct impacts to transportation resources associated with the Proposed Action would be minor, and indirect impacts to transportation are not anticipated.

The Proposed Action will cause impacts to roads in the vicinity of the Project Site during the construction of the solar facility. There will be an increase in traffic during construction activities on both Quincy Avenue and County Road 129 due to construction vehicles accessing and departing the Project Area. The increase in vehicle traffic will result in minor and temporary impacts to local traffic. These impacts will be present during the duration of construction activities.

Wear and tear on Quincy Avenue and County Road 129 is anticipated as a result of the increase in vehicle activity from the Proposed Action. Depending on their current condition and the number of overall trucks that use these roads during construction activities, impacts could be minor or major. The wear and tear of the Proposed Action will likely cause Quincy Avenue and County Road 129 to have repairs or be replaced soon than expected.

Overall minor impacts are anticipated as a result of the Proposed Action. A temporary increase in vehicles coming and going from the Project Area would cause temporary impacts to traffic in and around the area. There will likely be more wear and tear to the roads in the area that could lead to repairs or sections of these roads to be repaired in the future due to the increase in traffic and vehicles.

3.12 HUMAN HEALTH AND SAFETY

This section describes an overview of existing human health and safety, and the potential impacts associated with the Proposed Action. The identification of RECs known at the Project Site are included in this discussion of public health for both the protection of workers and the environment. Public health issues include emergency response and preparedness. These public health issues ensure project construction and facility operation do not pose a threat to public health and safety. Occupational (worker) safety would be in compliance with the Occupational Safety and Health Administration (OSHA) standards.

The American Society for Testing Materials (ASTM) defines a REC as, “the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. De minimis conditions are not recognized environmental conditions.”

3.12.1 Affected Environment – Human Health and Safety

The Project Site is located on privately-owned, undeveloped, agricultural land.

Two Phase I Environmental Site Assessments (ESAs) of the Project Site were conducted: one for the original 741.8-acre project area and one for the for 316-acre Geller Land Addition. These ESAs

were conducted in general accordance with the scope and limitations of ASTM Practice E 1527-13 and the All Appropriate Inquiries rule in Title 40 Code of Federal Regulations ("40 CFR") §312.21. No RECs associated with the Project Site were identified during either of the Phase I ESAs performed; however, the following health and safety-related issues were noted:

- Historical oil and gas wells are located within a half-mile radius of the Project Site. Currently, only 1 of the 14 wells is listed as producing (API #: 05-005-06978); however, this well is located greater than 2,000 feet to the northwest of the Subject Site. No oil and gas wells were located on the Project Site and no reports of spills or releases to the environment were found; however, workers at the Project Site may encounter odors due to oil and gas activity in the area.
- Portions of the Property have been, and currently are, used to grow row crops since at least 1937. Historically, it was not uncommon for row crops to be treated with systemic, accumulative pesticides that could persist in the environment for decades. In addition, seeds used to grow row crops were often treated with a mercury or other heavy metal-based coating.

While it is unlikely that residual pesticides and/or metals remain in the soil at the Project Site at concentrations that may be harmful to human health and/or the environment, workers will be advised of potential health risks and provided with proper personal protective equipment if deemed appropriate for close contact with soils during construction and/or maintenance activities. Analytical testing of soils that may be disturbed can be performed to quantify potential risks, which are presumed low.

Emergency services for any medical and/or fire-related incidents at the Project Site will be provided from the Bennett Walkins Fire Rescue. The Applicant has received a letter from the Bennet Watkins Fire Rescue approving the plan and vegetation management plan for the Project. The Proposed Project would designate emergency contacts and procedures prior to construction.

3.12.2 Environmental Consequences – Human Health and Safety

Construction of the solar facility would be constructed and there is an increased risk for workers during construction activities. Due to known hazards, contractors establish and maintain health and safety plans in compliance with OSHA regulations. These plans include BMPs to minimize potential risks to workers as well as protocols for safety management. Examples of BMPs include employee safety orientations; establishment of work procedures and programs for site activities; use of equipment guards; emergency shut-down procedures; lockout procedures; site housekeeping; personal protective equipment; regular safety inspections; and plans and procedures to identify and resolve hazards.

Under the Proposed Action, there could be potential public health and safety hazards resulting from construction traffic along public roadways including County Road 129 and East Quincy

Avenue. Access for construction traffic to the area surrounding the Project Site from outside the rural area would occur from I-70 or E-470.

Human health or safety hazards are not anticipated as a result of operations. During decommissioning, health and safety hazards would be similar to construction hazards. Minor, temporary impacts are anticipated to human health and safety in association with Proposed Action.

CHAPTER 4

4.0 CUMULATIVE EFFECTS

The cumulative effects assessment evaluates the effects of the Proposed Project and considers the effects of past, present, and reasonably foreseeable future actions occurring in the area affected by the proposal. This section discusses the direct and indirect impacts of the Proposed Project on the environmental resources listed in this EA. The Affected Environment and Environmental Consequences sections of Chapter 3, provides information about past and present environmental conditions, as well as future projections (as applicable). This chapter assesses cumulative impacts of the Proposed Action including reasonably foreseeable actions.

Construction of the Proposed Action is anticipated to last 9 to 12 months. Once the solar installation is constructed, the lease period for the array will be 20 years, with four 5-year extension options. After the lifetime of the project, the land of the Proposed Project can be returned to its original state.

Desktop research of potential past, present, and future actions in the vicinity of the Project Site was conducted. Resources examined included:

- Local news sources;
- IREA; and
- Arapahoe County.

4.1 PROJECTS CONTRIBUTING TO CUMULATIVE EFFECTS

The demand for clean energy is anticipated to continue to grow throughout Colorado given legislation that requires and 80% reduction in carbon emissions by 2030 and 90% by 2050 (IREA 2020). Municipalities including Arapahoe County, have policies in place to encourage companies to develop alternative sources of energy (Arapahoe County 2020).

It should be noted that there are three other solar developments that are in operation or planned in Arapahoe and adjacent Adams County. These include Victory Solar, Pioneer Solar, and Titan Solar. Victory Solar is a 12.8 MW utility-scale solar project in Adams County. It was IREAs first project and went into commercial operation at the end of 2016. Pioneer Solar is consists of an 80 MW of solar energy facility; it is also located in Adams County. The project was purchased by IREA in 2019 and is expected to be in commercial operation in 2022 (IREA 2020). Titan Solar is being developed by an affiliate of NextEra and will generate energy for Xcel Energy's Renewable* Connect program. The solar development will be 50 MW and located in Arapahoe County (Journal Advocate 2017).

In addition to these resources, IREA is in talks to purchase another 50-60 MW of solar energy from another solar developer. By 2025, IREA expects to have more than 187 megawatts of renewable energy available (IREA 2020).

4.2 CUMULATIVE EFFECTS OF THE HUNTER SOLAR, LLC PROJECT AND FORESEEABLE FUTURE PROJECTS IN THE AREA

The project is not expected to have a significant impacts to land use, floodplains, wetlands, water resources (including groundwater and surface water), biological resources (including threatened and endangered species), historic properties and cultural resources, aesthetics, air quality, socioeconomics /environmental justice, noise, transportation, or health and safety. However, the other identified projects' impacts combined with the proposed action could contribute to cumulative effects for certain resources as discussed below.

4.2.1 Land Use

The general land use in the Project Site is agricultural, consisting of 443 acres out of the 571 total acres of the site. Although the Project Site can be farmed in the future, this project may encourage future conversions in the area and the landscape could change over time. Due to increased demand for alternative energy, more agricultural land may be converted to solar farms in the future.

4.2.2 Floodplains

There will be no impact to floodplains as a result of the Proposed Action, therefore, no immediate cumulative impacts are anticipated. Construction of future solar farms in the area could impact floodplains in the area. No adverse cumulative effects to floodplains are anticipated from the construction of the Proposed Action.

4.2.3 Wetlands

The Proposed Action will not directly impact wetlands and/or waterbodies. The project site was selected in order to minimize effects to wetlands and waterbodies but, to still facilitate the generation of a significant amount of electrical energy to support the surrounding community. The site was strategically selected as it had been previously cleared for agricultural purposes and would not contribute to the degradation of undeveloped land and/or protected aquatic resources. As of the date of this EA, three other solar developments are in operation and/or are planned in Arapahoe and adjacent Adams County. In addition to the three solar developments, IREA plans to purchase another 50-60 MW of solar energy from another solar developer. The construction of additional solar farms to meet increased demand for alternative energy in the area could add to incremental losses to wetlands.

4.2.4 Water Resources

BMPs to prevent erosion and sedimentation would be expected on any large, future development projects. Hunter Solar, LLC is committed to avoiding and minimizing impacts to wetlands, and waterbodies. There could be a minor cumulative improvement to water quality as a result of less soil disturbance and pesticide and fertilizer use from farms in the area. Impacts of the Proposed Action when taken into consideration with other past, present, and reasonably foreseeable future

actions affecting water quality, may be beneficial with regard to nitrification of local water bodies. Overall impacts to water resources are anticipated to be minor.

4.2.5 Biological Resources

Agricultural development is the primary past and present driver for impacts to biological resources in this part of Arapahoe County. Historically, this site was primarily used for agricultural row crops and/or cattle grazing fields since 1937 and continues to be used for agricultural purposes today. The project site was selected in order to minimize effects to biological resources but, to still facilitate the generation of a significant amount of electrical energy to support the increase in demand of the surrounding community. Incremental habitat loss, fragmentation, and degradation are still a threat to biological resources; however, by repurposing already impacted/developed agricultural land, the immediate direct impacts to biological resources is avoided for the Proposed Action. As of the date of this EA, three other solar developments are in operation and/or are planned in Arapahoe and adjacent Adams County. In addition to the three solar developments, IREA plans to purchase another 50-60 MW of solar energy from another solar developer. The construction of additional solar farms to meet increased demand for alternative energy in the area could add to the incremental fragmentation of habitats unless already developed land is utilized for the construction. Consultation with the USFWS is complete.

4.2.6 Historic and Cultural Properties

The Preferred Alternative would have anticipated impacts to Cultural Resources and Historic Properties. No cumulative effects are anticipated for this environmental resource. Consultation with the OAHP and the tribes is complete.

4.2.7 Visual Resources

The construction and operational associated with the Proposed Action would have a v minor impact on the visual character of the immediate Project Site area. Due to increased demand for alternative energy, more agricultural land may be converted to solar farms in the future, increasing the industrial appearance in the surrounding area. With the use of the proposed setbacks and privacy fence, the cumulative impact to visual resources would be minimal.

4.2.8 Air Quality

The Preferred Alternative would have minor short-term impacts on air quality. However, these impacts would be temporary and minor with the use of BMPs. Furthermore, the Proposed Action will comply with Colorado's APEN. Future solar projects could lead to a decrease in agricultural practices in the area and therefore less demand for petroleum based fuels for farm equipment.

4.2.9 Socioeconomics/Environmental Justice

During construction, the proposed project may cause minor beneficial impacts to socioeconomics in the area due to possible temporary employment. Additional beneficial cumulative impacts

would occur in the advent of future projects due to additional employment opportunities. It is likely most of these impacts would be temporary, as a relatively small number of people would be employed for operations and maintenance. Furthermore, no minority or low-income populations have been identified in the vicinity of the Project Site. Therefore, there are no disproportionate impacts on human health or the environment for minority or low income populations.

4.2.10 Miscellaneous Issues

Temporary noise levels and transportation may increase during the construction period of the Proposed Action. No other known solar projects are anticipated in the vicinity of the Proposed Action during the time of construction. As such, cumulative impacts to noise and transportation are anticipated to be minor.

4.2.11 Human Health and Safety

There is a potential for impacts to health and human safety as a result of construction work and traffic accidents; these impacts, however, are anticipated to be minor and temporary. Due to increased demand for alternative energy, more solar facilities may be constructed in the future. As such, there is a potential for adverse cumulative impacts to health and human safety.. Due to all of these projects adhering to OSHA regulations and the utilization of safety BMPs, these impacts would be minor and temporary.

5.0 SUMMARY OF MITIGATION

As described in Chapter 3, Hunter Solar, LLC would implement various mitigation measures to minimize potential environmental impacts associated with the construction and operation of the Hunter Solar, LLC Project. The following list summarizes the mitigation measures Hunter Solar, LLC would implement:

- Obtaining and complying with all applicable federal, state, and local permits and ordinances;
- Maintaining front and side setbacks of 100 feet and rear setbacks of 50 feet from wetlands and waterbodies, and avoiding these buffers during construction to the greatest extent feasible. Utilizing BMPs to minimize any soil disturbance within the buffers of on-site wetlands and WOTUS;
- Utilizing BMPs for controlling soil erosion and run-off;
- If hazardous waste is generated by the Proposed Action, it would be collected and disposed of in an appropriate location in accordance with an approved SPCC plan;
- Weed control would be conducted consistent with the Colorado's Department of Agriculture Colorado Noxious Weeds Act;
- Limit construction disturbance the minimum area required to perform work;
- Conducting a survey for burrowing owl habitat prior to initial site disturbance, if these activities fall within the burrowing owl nesting season (March 15th through October 31$^{st)}$;
- Re-vegetating temporarily disturbed areas with appropriate native seed mix as soon as possible after construction is complete to prevent weed establishment;

- Using certified weed-free products for erosion control;
- Employ the appropriate manual, mechanical, and chemical control methods to target species;
- Maintaining equipment and vehicles to insure minimal emissions;
- Complying with CDOT Maximum Legal Dimensions and Weights on State, Federal and Local Routes for transport vehicles;
- Hunter Solar, LLC executed a Road Use Agreement that included a plan for maintaining and/or repairing affected roads; and
- Contractors would follow the CSWPPP, conforming to CDPHE and NPDES guidelines.

CHAPTER 5

6.0 LITERATURE CITED

Arapahoe County. 2020 Arapahoe County Comprehensive Plan. Accessed September 2020 at https://www.arapahoegov.com/DocumentCenter/View/9445/2018-Comprehensive-Plan-with-Amendments-thru-1-24-2020

Bureau of Economic Analysis (BEA). 2018a. Personal Income Summary: Personal Income, Population, Per Capita Personal Income for Arapahoe County, Colorado. Accessed September 2020 at https://www.bea.gov/data/income-saving/personal-income-county-metro-and-other-areas.

BEA. 2018b. Total Full-Time and Part-Time Employment by NAICS Industry. Arapahoe County, Colorado, and USA. Accessed September 2020 at https://www.bea.gov/data/employment/employment-by-industry.

Bureau of Labor Statistics. 2020. Local Area Unemployment Statistics. Data extracted September 2020 via https://beta.bls.gov/dataQuery/find?fq=survey:[la]&s=popularity:D.

Colorado Department of Transportation. Stormwater Management Plant Procedures. Accessed at https://www.codot.gov/programs/environmental/landscape-architecture/erosion-storm-quality/swqchapter4.pdf

Colorado Parks and Wildlife (CPW): Threatened and Endangered List. Accessed September 2020. Available at https://cpw.state.co.us/learn/Pages/SOC-ThreatenedEndangeredList.aspx

Construction Noise Handbook. 9.0 Construction Equipment Noise Levels and Ranges - Handbook - Construction Noise - Noise - Environment - FHWA. N.p., n.d. Web. June 2020.

Cowardin 1979. Classification of Wetlands and Deepwater Habitats of the United States. December. U.S. Department of the Interior, Fish and Wildlife Service. Available at https://www.nrc.gov/docs/ML1801/ML18019A904.pdf

Council on Environmental Quality (CEQ). 1997. Environmental Justice: Guidance Under the National Environmental Policy Act. December 10, 1997. Accessed September 2020 at https://www.epa.gov/sites/production/files/2015-02/documents/ej_guidance_nepa_ceq1297.pdf.

Department of Housing and Urban Development (HUD). 2009. U.S. Department of Housing and Urban Development (HUD). 2009. The Noise Guidebook, Chapter 2, Washington, D.C., Superintendent of Documents, U.S. Government Printing Office. Accessed September 2020 at https://www.hudexchange.info/onecpd/assets/File/Noise-Guidebook-Chapter-2.pdf

Department of Local Affairs (DOLA) 2020a. Colorado Department of Local Affairs: Population Data. 2020. Accessed October 2020 at https://cdola.colorado.gov/1041-regulations-coloradoDepartment of Local Affairs (DOLA) 2020b. Colorado Department of Local

Affairs: Population Data. 2020. Accessed September 2020 at https://demography.dola.colorado.gov/population/

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Final Report – January 1987. Wetlands Research Program Technical Report Y-87-1. Available online at https://www.lrh.usace.army.mil/Portals/38/docs/USACE%2087%20Wetland%20Delineation%20Manual.pdf

Environmental Protection Agency (EPA). 1974. United States Environmental Protection Agency 1974. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with An Adequate Margin of Safety. March 1974. Prepared by the U.S. Environmental Protection Agency Office of Noise Abatement and Control. Accessed September 2020 at https://nepis.epa.gov/Exe/ZyPDF.cgi/2000L3LN.PDF?Dockey=2000L3LN.PDF

EPA. Green Book | US EPA, 22 Sept. 2016. Accessed September 2020 at https://www.epa.gov/green-book

EPA. 2015. NAAQS Table -National Ambient Air Quality Standards for criteria air pollutants. Final rule signed October 1, 2015, and effective December 28, 2015. Accessed September 2020 at https://www.epa.gov/criteria-air-pollutants/naaqs-table.

EPA. 2020a. NEPAssist Report; Hunter Solar and 1-mile Buffer. Report generated September 2020 via https://www.epa.gov/nepa/nepassist.

EPA 2020b. Overview of Greenhouse Gases and Greenhouse Gas (GHG) Emissions. Accessed September 2020 at https://www.epa.gov/ghgemissions/overview-greenhouse-gases

EPA. 2020c. EJSceen. Report generated September 2020 via https://ejscreen.epa.gov/mapper/

Executive Order No. 11988. May 24, 1977. Accessed at https://www.wbdg.org/FFC/FED/EO/eo11988.pdf

Federal Highway Administration. 2011. Federal Highway Administration. Highway Traffic Noise: Analysis and Abatement Guidance. December 2011 FHWA-HEP-10-025. Accessed September 2020 at http://www.fhwa.dot.gov/environment/noise/regulations_and_guidance/analysis_and_abatement_guidance/revguidance.pdf

Federal Emergency Management Agency (FEMA). 2011. FEMA Flood Map Service Center: Search by Address for Arapahoe County. Available online at https://msc.fema.gov/portal/home. Accessed May 2020.

International Organization for Standardization (ISO). 1996. Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation, ISO 9613-2: 1996(E). Accessed September 2020 at https://www.sis.se/api/document/preview/608579/

Minnesota Pollution Control Agency. 2017. Managing Stormwater Sediment Best Management Practices Guidance. Accessed at https://www.pca.state.mn.us/sites/default/files/wq-strm4-16.pdf

National Resources Conservation Service (NRCS) 2006. MLRR LRR Handbook. Accessed at https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_050898.pdf

NOAA. Find Average Wind Speed for US Cities: Average Monthly and Annual Wind Speed for US Cities. N.p., n.d. Accessed July 2020 at https://www.climate.gov/maps-data/dataset/average-wind-speeds-map-viewer

NRCS. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/. Accessed September 2020.

National Wild and Scenic Rivers System. 2019. National Wild and Scenic Rivers in Colorado. Accessed September 2020 at https://www.rivers.gov/colorado.php.

Occupational Safety and Health Administration (OSHA). 2002. Occupational Noise Exposure. Hearing Conservation Program. Accessed at https://www.osha.gov/SLTC/noisehearingconservation/hearingprograms.html

Quora. 2020. What is the difference between dB(A) and dB (in measuring sound)? Accessed September 2020 at https://www.quora.com/What-is-the-difference-between-dB-A-and-dB-in-measuring-sound.

Spirit Environmental. 2017a. Wetland Delineation Report for Hunter Solar, LLC. Prepared for Cypress Creek Renewables, LLC. Dated August 11, 2017, Revised August 15, 2017.

Spirit Environmental. 2017b. Phase I Environmental Site Assessment Hunter Solar, LLC. Prepared for Cypress Creek Renewables, LLC. Dated August 11, 2017.

Spirit Environmental. Environmental Impact Analysis Hunter Solar Geller Land Addition. Prepared for Hunter Solar, LLC. Dated July 9, 2020, Revised September 25, 2020.

Spirit Environmental. 2020a. Wetland and Waterbody Delineation Report for Hunter Solar, LLC – Geller Addition. Prepared for Torch Clean Energy. Dated June 2020.

Spirit Environmental. 2020b. Phase I Environmental Site Assessment Hunter Solar Geller Parcel. Prepared for Hunter Solar, LLC. Dated June 2020.

Spirit Environmental. Environmental Impact Analysis. Hunter Solar, LLC. Prepared for Cypress Creek Renewables, LLC. Dated August 11, 2017, Revised August 15, 2017.

SWCA. 2020. A Class II Cultural Resource Inventory for the Hunter Solar Project, Arapahoe County, Colorado. Dated June 2020.

US Army Corps of Engineers (USACE). March 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0), ed. J.S. Wakely, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-10-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

US Census Bureau (USCB). 2000. Profile of General Demographic Characteristics: 2000; Census 2000 Summary File 1 (SF 1) 100-Percent Data for Arapahoe County and Colorado. Accessed September 2020. at https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml.

USCB. 2010. Profile of General Population and Housing Characteristics: 2010; 2010 Demographic Profile Data for Arapahoe County, Colorado. September 2020 at https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml.

USCB. 2017. American Community Survey Demographic and Housing Estimates; 2013-2017 American Community Survey 5-Year Estimates for Arapahoe County and Colorado Accessed September 2020. at https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml.

USCB. 2018. American Community Survey 2013-2018, 5-year Estimates. By Block Group, Census Block Group 1, Census Tract 71.06. Accessed at https://www.census.gov/programs-surveys/acs/data.html.

United States Department of Agriculture (USDA). 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. United States Department of Agriculture Handbook 296. Issued 2006.

USDA 2017. Census of Agriculture Arapahoe County Colorado Profile. Accessed at https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Illinois/cp17145.pdf

USDOT 2006. U.S. Department of Transportation Federal Highway Administration. Accessed 3/28/2019 at Roadway Construction Noise Model User's Guide, January 2006. FHWA-HEP-05-054, DOT-VNTSC-FHWA-05-01. Accessed September 2020 at https://www.fhwa.dot.gov/Environment/noise/construction_noise/rcnm/rcnm.pdf

USDOT 2011. "Construction Noise Handbook." U.S. Department of Transportation Federal Highway Administration. Accessed September 2020 at http://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook07.cfm

US Fish and Wildlife Service (USFWS). 2001. Species Account Information for the Bald Eagle (Haliaeetus leucocephalus); Tulsa Ecological Field Service Office; August. URL: https://ecos.fws.gov/ecp0/profile/speciesProfile?sId=1626.

USFWS. 2007b. National Bald Eagle Management Guidelines. Washington, DC; pp. 1-23. May. http://www.fws.gov/southdakotafieldoffice/NationalBaldEagleManagementGuidelines.pdf

US Geological Survey. 2016. Topographic Map for Strasburg NW, CO, Strasburg SW, CO

USGS. 2017. The State Geologic Map Compilation (SGMC) Geodatabase of the Conterminous United States. Accessed at https://mrdata.usgs.gov/geology/state/

USGS. 1987a. Hydrologic Unit Maps. Adapted from Seaber, P.R., Kapinos, F.P., and Knapp, G.L. Accessed via ArcGIS application from https://water.usgs.gov/GIS/huc.html.

US General Services Administration 1972. Noise Control Act. Accessed September 2020 at https://www.gsa.gov/cdnstatic/Noise_Control_Act_of_1972.pdf

US Water Resources Council 1978. Guidelines for Implementing Executive Order 11988, Floodplain Management. FR Vol. 43, No. 29—Friday, February 10, 1978. pp. 6030-6054.

Table 7-1 summarizes the expertise and contribution made to the EA by the Project Team.

Name/Education	Experience
Margaret Mike MS Historic Preservation	7 years in regulatory and NEPA compliance, Section 106 compliance, cultural resources, including project management and tribal/agency consultation
Jacqueline Smolik, PWS B.S. Environmental Geosciences	5 years of experience in NEPA document preparation; 7 years in natural resource environmental services including project management and Section 404/10 CWA and RHA and Section 7 ESA compliance.
Michele Foss M.S., Recreation and Resource Development B.S., Geophysics	9 years of experience in in NEPA compliance and document preparation; 23 years in environmental services, technical evaluations, and assessments
Trevor Hartwig B.A., Ecology and Evolutionary Biology	3 years in NEPA document preparation; 4 years in natural resource environmental services.